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Installation, Operation &
Service Instructions
with Parts List

Culligan Medallist Series®
Automatic Water Conditioner

Models from 2007

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Attention Culligan Customer:

The installation, service and maintenance of this equipment should be rendered by a qualified and trained service technician. Your local independently operated Culligan dealer employs trained service and maintenance personnel who are experienced in the installation, function and repair of Culligan equipment. This publication is written specifically for these individuals and is intended for their use.

We encourage Culligan users to learn about Culligan products, but we believe that product knowledge is best obtained by consulting with your Culligan dealer. Untrained individuals who use this manual assume the risk of any resulting property damage or personal injury.

Warning! Prior to servicing equipment, disconnect power supply to prevent electrical shock.

Warning! If incorrectly installed, operated or maintained, this product can cause severe injury. Those who install, operate, or maintain this product should be trained in its proper use, warned of its dangers, and should read the entire manual before attempting to install, operate or maintain this product.

If this equipment is to be used in the treatment of drinking water, the water must be microbiologically safe.

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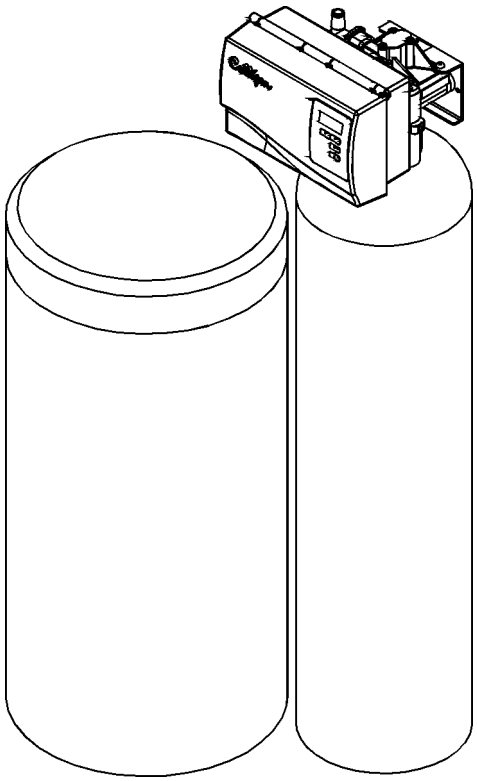

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Introduction

The Culligan Medallist Series™ 8" Water Softeners are tested and certified by WQA against NSF/ANSI Standard 44 for the effective reduction of hardness (calcium and magnesium) and barium/radium as verified and substantiated by test data.

The Culligan Medallist Plus Series™ 30, 45 and 60 Water Softeners are tested and certified by WQA against NSF/ANSI Standard 44 for the effective reduction of hardness (calcium and magnesium) and barium/radium as verified and substantiated by test data.

The Culligan Medallist Plus Series™ 30, 45 and 60 Water Softeners are tested and certified by WQA against NSF/ANSI Standard 61 for material requirements.

Hardness sample kits are available through your Culligan dealer.

For installations in Massachusetts, Massachusetts Plumbing Code 248 CMR shall be adhered to. Consult your licensed plumber for installation of this system. This system and it's installation must comply with state and local regulations. The use of saddle valves is not permitted.

Safe Practices

Note: *Check and comply with your state and local codes. You must follow these guidelines.*

Throughout this manual there are paragraphs set off by special headings. Example:

Note: Note is used to emphasize installation, operation or maintenance information which is important, but does not present any hazard.

Note: *The nipple must extend no more than 1 inch above the cover plate.*

Caution! Caution is used when failure to follow directions could result in damage to equipment or property. Example:

Caution! Disassembly while under water pressure can result in flooding.

Warning! Warning is used to indicate a hazard which could cause injury or death if ignored. Example:

Warning! Electrical shock Hazard! Unplug the unit before removing the cover or accessing any internal control parts!

Serial Numbers

- The control valve serial number is located on the back of the control.
- The media tank serial number is located on the top surface of the tank.

Note: *Do not remove or destroy the serial number. It must be referenced on request for warranty repair or replacement.*

This publication is based on information available when approved for printing. Continuing design refinement could cause changes that may not be included in this publication.

Specifications

Culligan Medallist Series™ Water Conditioner With Timeclock Or Soft-Minder® Meter

	8" Model	30 Model	45 Model	60 Model
Control Valve Type	3/4" 5-cycle Reinforced Thermoplastic	1" 5-cycle Reinforced Thermoplastic	1" 5-cycle Reinforced Thermoplastic	1" 5-cycle Reinforced Thermoplastic
Overall Conditioner Height	51 in. / 1,295 mm	49 in. / 1,245 mm	63 in. / 1,600 mm	61 in. / 1,549 mm
Media Tank Dimensions (Dia. x Ht.)	8 x 44 in. 203 x 1,118 mm	10 x 40 in. 254 x 1,016 mm	10 x 54 in. 254 x 1,372 mm	12 x 52 in 305 x 1321 mm
Salt Storage Tank Dimensions (Dia. x Ht.)	16 x 43 in. 406 x 1,092 mm	18 x 43 in. 457 x 1,092 mm	18 x 43 in. 457 x 1,092 mm	18 x 43 in. 457 x 1,092 mm
Exchange Media, Type & Quantity	Cullex® Media, 0.7 ft^3	Cullex Media, 1.0 ft^3	Cullex Media, 1.5 ft^3	Cullex Media, 2.0 ft^3
Underbedding, Type & Quantity	Cullsan® Underbedding, 6 lb.	Cullsan Underbedding, 15 lb.	Cullsan Underbedding, 15 lb.	Cullsan Underbedding, 16 lb.
Exchange Capacity @ Salt Dosage Per Recharge[1]	17,004 gr @ 4 lb.	17,172 gr @ 4 lb.	26,770 gr @ 6 lb.	35,614 gr @ 8 lb.
	22,947 gr @ 9 lb.	23,664 gr @ 8 lb.	38,830 gr @ 12 lb.	51,659 gr @ 16 lb.
	24,853 gr @ 12 lb.	27,700 gr @ 12 lb.	45,493 gr @ 18 lb.	60,523 gr @ 24 lb.
Efficiency at Rated Salt Dosage[5]	4251 gr/lb @ 4 lb. salt dosage	4293 gr/lb @ 4 lb. salt dosage	4461 gr/lb @ 6 lb. salt dosage	4451 gr/lb @ 8 lb. salt dosage
Freeboard to Media[2]	20.5 - 21.5 in.	13 in.	15 in.	16 in.
Freeboard to Underbedding[3]	42.0 - 42.5 in.	35 in.	48 in.	46 in.
Salt Storage Capacity	250 lb. or 375 lb.	375 lb.	375 lb.	375 lb.
Rated Service Flow @ Pressure Drop	5.9 gpm @ 12 psi	10.0 gpm @ 15 psi	9.4 gpm @ 15 psi	10.2 gpm @ 15 psi
Total Hardness, Maximum	75 gpg	75 gpg	99 gpg	99 gpg
Total Iron, Maximum (dissolved)	5 ppm	5 ppm	5 ppm	5 ppm
Hardness to Iron Ratio, Minimum	8 gpg to 1 ppm	8 gpg to 1 ppm	8 gpg to 1 ppm	8 gpg to 1 ppm
	140 mg/L to 1 mg/L	140 mg/L to 1 mg/L	140 mg/L to 1 mg/L	140 mg/L to 1 mg/L
Operating Pressure	20 - 125 psi	20 - 125 psi	20 - 125 psi	20 - 125 psi
	140 - 860 kPa	140 - 860 kPa	140 - 860 kPa	140 - 860 kPa
Operating Pressure (Canada)	20 - 90 psi	20 - 90 psi	20 - 90 psi	20 - 90 psi
	140 - 620 kPa	140 - 620 kPa	140 - 620 kPa	140 - 620 kPa
Operating Temperature	33 - 120°F	33 - 120°F	33 - 120°F	33 - 120°F
	1 - 50°C	1 - 50°C	1 - 50°C	1 - 50°C
Electrical Requirements	24V/60 Hz	24V/60 Hz	24V/60 Hz	24V/60 Hz
Electrical Power Consumption, Min./Max.	3 Watts/35 Watts	3 Watts/35 Watts	3 Watts/35 Watts	3 Watts/35 Watts
Drain Flow, Maximum[4]	1.1 gpm	1.7 gpm	1.6 gpm	2.6 gpm
Recharge Time, Average	85 min.	64 min.	64 min.	52 min.
Recharge Water Consumption	23.3 gal.	36 gal.	46 gal.	51 gal.

1 Capacities and corresponding salt dosages pertain to low hardness waters. Capacities given per recharge

2 Measured from top of media to top of inlet fitting (backwashed and drained) for 8" tanks. Measured from top of media to top surface of tank threads for 10" and 12" tanks.

3 Measured from top of underbedding to top of inlet fitting for 8" tanks. Measured from top of media to top surface of tank threads for 10" and 12" tanks.

4 Backwash at 120 psi (830 kPa)

5 Efficiency rating only valid at stated salt dosage on Soft-Minder models and is efficiency rated according to NSF/ANSI Standard 44

Preparation

Component Description

The water conditioner is shipped from the factory in a minimum of three cartons. Remove all components from their cartons and inspect them before starting installation.

Control Valve Assembly - Includes the 5-cycle regeneration control valve and the Accusoft® Microprocessor. A small parts pack will contain additional installation hardware. An Owner's Guide is included.

Media Tank - 8" and 10" media tanks are shipped filled with Cullex® ion exchange resin, underbedding and outlet manifold. For 12" tanks, the Cullex® ion exchange reclaim and underbedding are loaded at the installation site.

Salt Storage Tank Assembly - Includes salt storage container with support plate and Dubl-Safe™ brine refill valve and chamber.

Bypass Valve - Includes the Cul-Flo-Valv®, interconnecting couplings, and the screws necessary for assembly (Bypass Valve included with Control for Medallist Plus).

Tools and Materials

The following tools and supplies will be needed, depending on installation method.

Note: *Check and comply with your state and local codes. You must follow these guidelines.*

For installation in Massachusetts, Massachusetts Plumbing Code 248 CMR shall be adhered to. Consult your licensed plumber for installation of this system. This system and its installation must comply with state and local regulations. The use of saddle valves is not permitted.

All Installations

- Safety glasses
- Phillips screwdrivers, small and medium tip.
- Gauge assembly (PN 00304450 or equivalent)
- Silicone lubricant (PN 00471507 or equivalent) - **DO NOT USE PETROLEUM-BASED LUBRICANTS**
- A bucket, preferably light-colored
- Towels

Special Tools

- Torch, solder and flux for sweat copper connections
- Use only lead-free solder and flux for all sweat-solder connections, as required by state and federal codes.
- Threading tools, pipe wrenches and thread sealer for threaded connections.
- Saw, solvent and cement for plastic pipe connections.

Materials

- Brine line, 3/8" (PN 01009819 or equivalent) for 8" and 10" tanks or 1/2" (PN 00901800 or equivalent) for 12" tanks.
- Drain line, 1/2" (PN 00303082, gray, semi-flexible; or PN 00-3319-46, black, semi-rigid; or equivalent)
- Thread sealing tape
- Pressure reducing valve (if pressure exceeds 125 psi [860 kPa], PN 00490900 or equivalent)
- Pipe and fittings suited to the type of installation
- Water softener salt (rock, solar or pellet salt formulated specifically for water softeners)

Application

Water quality - Verify that raw water hardness and iron are within limits. Note the hardness for setting the salt dosage and recharge frequency.

Iron - Iron is a common water problem. The chemical/physical nature of iron found in natural water supplies is exhibited in four general types.

1. **Dissolved Iron -** Also called ferrous or “clear water” iron. Up to 5 ppm of this type of iron can be removed from the water by the same ion exchange principle that removes the hardness elements, calcium and magnesium. Dissolved iron is soluble in water and is detected by taking a sample of the water to be treated in a clear glass. The water in the glass is initially clear, but on standing exposed to the air, it may gradually turn cloudy or colored as it oxidizes.
2. **Particulate Iron -** Also called ferric or colloidal iron. This type of iron is an undissolved particle of iron. A softener will remove larger particles, but they may not be washed out in regeneration effectively and will eventually foul the ion exchange resin. A filtering treatment will be required to remove this type of iron.
3. **Organic Bound Iron -** This type of iron is strongly attached to an organic compound in the water. The ion exchange process alone cannot break this attachment and the softener will not remove this type of iron.
4. **Bacterial Iron -** This type of iron is protected inside a bacteria cell. Like the organic bound iron, it is not removed by a water softener.

When using a softener to remove both hardness and up to 5 ppm of dissolved iron it is important that it regenerates more frequently than ordinarily would be calculated for hardness removal alone. Although many factors and formulas have been used to determine this frequency, it is recommended that the softener be regenerated when it has reached 50 - 75% of the calculated hardness alone capacity. This will minimize the potential for bed fouling (iron removal claims have not been verified by the Water Quality Association or Underwriters Laboratories).

If you are operating a water softener on clear water iron, regular resin bed cleaning is needed to keep the bed from coating with iron. Even when operating a softener on water with less than the maximum of dissolved iron, regular cleanings should be performed. Clean every six months or more often if iron appears in your conditioned water supply. Use resin bed cleaning compounds carefully following the directions on the container.

Pressure - If pressure exceeds 125 psi (860 kPa), install a pressure reducing valve (see materials checklist). On private water systems, make sure the minimum pressure (the pressure at which the pump starts) is greater than 20 psi (140 kPa). Adjust the pressure switch if necessary.

Caution! Do not use where the water is microbiologically unsafe or with water of unknown quality adequate disinfection before or after the unit.

Caution! The use of a pressure reducing valve may limit the flow of water in the household.

Temperature - Do not install the unit where it might freeze, or next to a water heater or furnace or in direct sunlight. Outdoor installation is not recommended, and voids the warranty. Use the Culligan Outdoor Medallist Series Softener for outdoor installations. The Culligan Outdoor Medallist Series Softener has been certified by Underwriter’s Laboratories for outdoor installation. If installing in an outside location, you must take the steps necessary to assure the softener installation plumbing, wiring, etc. areas well protected from the elements (sunlight, rain, wind, heat, cold), contamination, vandalism, etc. as when installed indoors.

Location

Space requirements - Allow 6-12 inches (15-30 cm) behind the unit for plumbing and drain lines and 4 feet (1.3 meters) above for service access and filling the salt container.

Floor surface - Choose an area with solid, level floor free of bumps or irregularities. Bumps, cracks, stones and other irregularities can cause the salt storage tank bottom to crack when filled with salt and water.

Drain facilities - Choose a nearby drain that can handle the rated drain flow (floor drain, sink or stand pipe). Refer to the Drain Line Chart, Table 3 (page 25), for maximum drain line length.

Note: *Most codes require an anti-siphon device or air gap. Observe all local plumbing codes and drain restrictions. The system and installation must comply with all state and local laws and regulations.*

Electrical facilities - A 10-foot cord and wall mount plug-in transformer are provided. The customer should provide a receptacle, preferably one not controlled by a switch that can be turned off accidentally. Observe local electrical codes.

Note: *The softener works on 24 volt - 60 Hz electrical power only. Be sure to use the included transformer. Be sure the electrical outlet and transformer are in an inside location to protect from moisture. Properly ground to conform with all governing codes and ordinances.*

Note: *P.N. 01018133 plug-in transformer is rated for indoor installations only.*

P.N. 01015972 plug-in transformer is rated for indoor/outdoor installations.

Terms

Brine - A solution of water and salt used to regenerate the resin

Distributor - A pipe with slits that allows the water to enter and leave inside the media tank

Media - The underbedding and resin the media tank holds

Regenerate - A process where the resin once exhausted of its softening capabilities is revitalized to soften again

Resin - The actual material that softens hard water, shaped like little beads

Underbedding - A gravel mixture that keeps the resin from entering the distributors

Brine Tank

Refer to section “Filling the Salt Storage Container”, page 29 for proper Brine Tank usage.

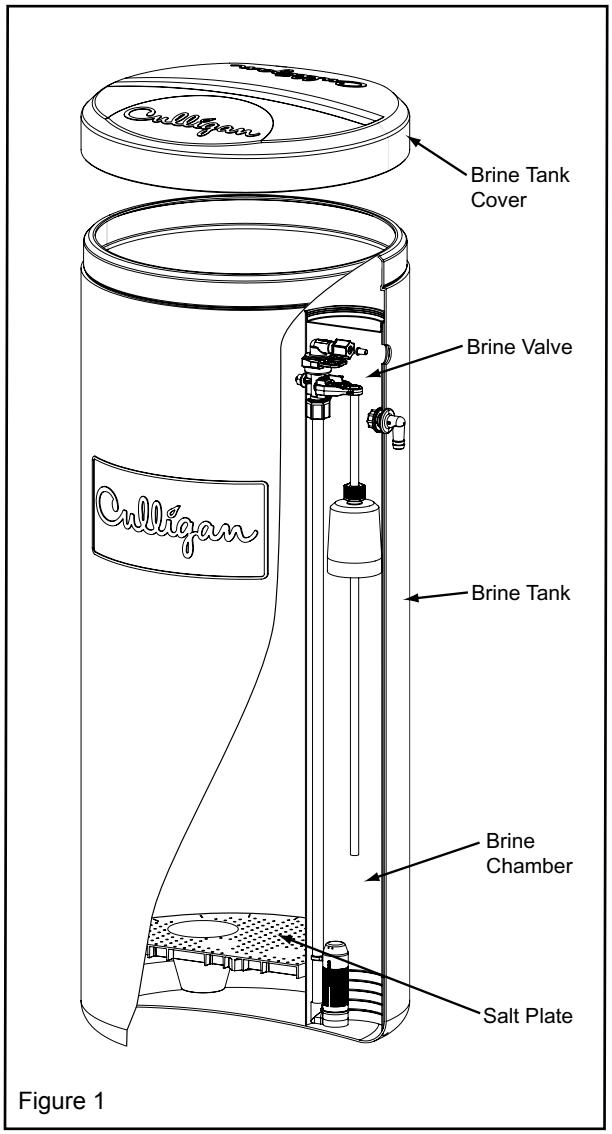


Figure 1

Media Tank

The letters underneath the component’s description refer to the values listed on Appendix A, Table 2 - Media Volumes and Freeboard.

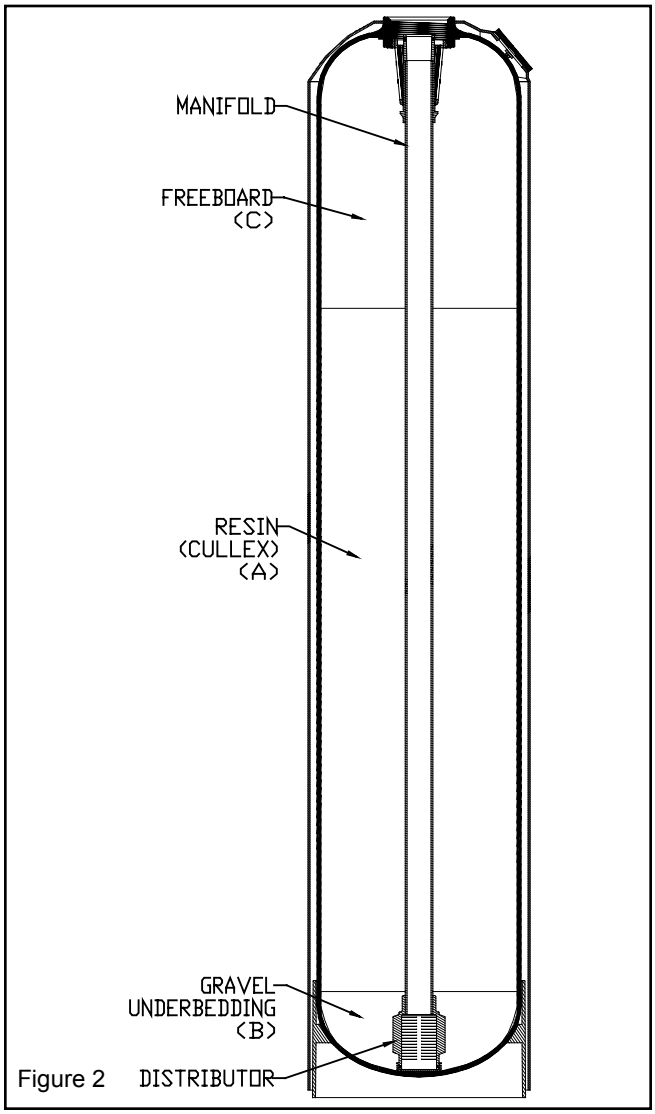


Figure 2

What Is Hard Water?

Water is said to be hard when it carries too high a concentration of calcium and magnesium. Acceptable water hardness levels will vary depending on the application.

How Does It Work?

The components of dissolved minerals are called ions. They carry either a positive or negative charge. Hardness ions of minerals dissolved in water carry a positive charge. These positively charged ions (cations) are attracted to a synthetic softening material called ion exchange resin.

The heart of the softening system, therefore, is a deep bed of resin which draws calcium and magnesium ions, as well as ferrous iron, from the water as it passes through the resin bed.

Can The Resin Draw Out Hardness Ions Indefinitely?

No. During normal operation, the resin becomes saturated with positive ions and functions less efficiently. When hardness leakage occurs, the resin should be regenerated to restore its efficiency.

How Do You Regenerate Resin?

You regenerate a resin bed by removing the mineral ions through a process called “ion exchange”. This regeneration process occurs in four steps and takes approximately 50 to 70 minutes. Each of the following steps are graphically depicted on pages 11-15.

1. **Backwash**
   During the backwash step, raw water flows rapidly upward (in reverse direction to the service flow) through the resin bed to expand the bed and flush out accumulated dirt, sediment and other sources of turbidity.

2. **Brine Draw**
   The brine solution consisting of water and salt is drawn from a brine storage tank and allowed to flow slowly down through the resin bed. The brine solution removes the calcium and magnesium ions from the resin.

3. **Slow Rinse**
   Brine draw is then followed by a raw water slow rinse. This rinse step will slowly remove most of the remaining brine, exchanged calcium and magnesium ions from the resin.

4. **Fast Rinse**
   Slow rinse is followed by a raw water flush, a very rapid down flow of raw water which removes the last traces of brine, and settles the resin bed.

How Often Must You Regenerate?

Frequency must be determined for each installation based on the amount of water usage, its degree of hardness and the amount of resin through which it flows. In some cases it is necessary to utilize a resin cleaner when the raw water contains iron. Contact your local Culligan dealer for more information.

How Do You Control The Regeneration Process?

The regeneration process for the water softener is controlled automatically either on a predetermined time, or volume through the use of the Culligan Accusoft controller with flow sensor. The regeneration process can also be initiated manually by the operator as required.

Service

Refer to Figure 3

Raw water is allowed in the inlet to the top of the tank. The water is run through the resin up the manifold to the outlet. The water to the outlet should be soft if the system is operating properly.

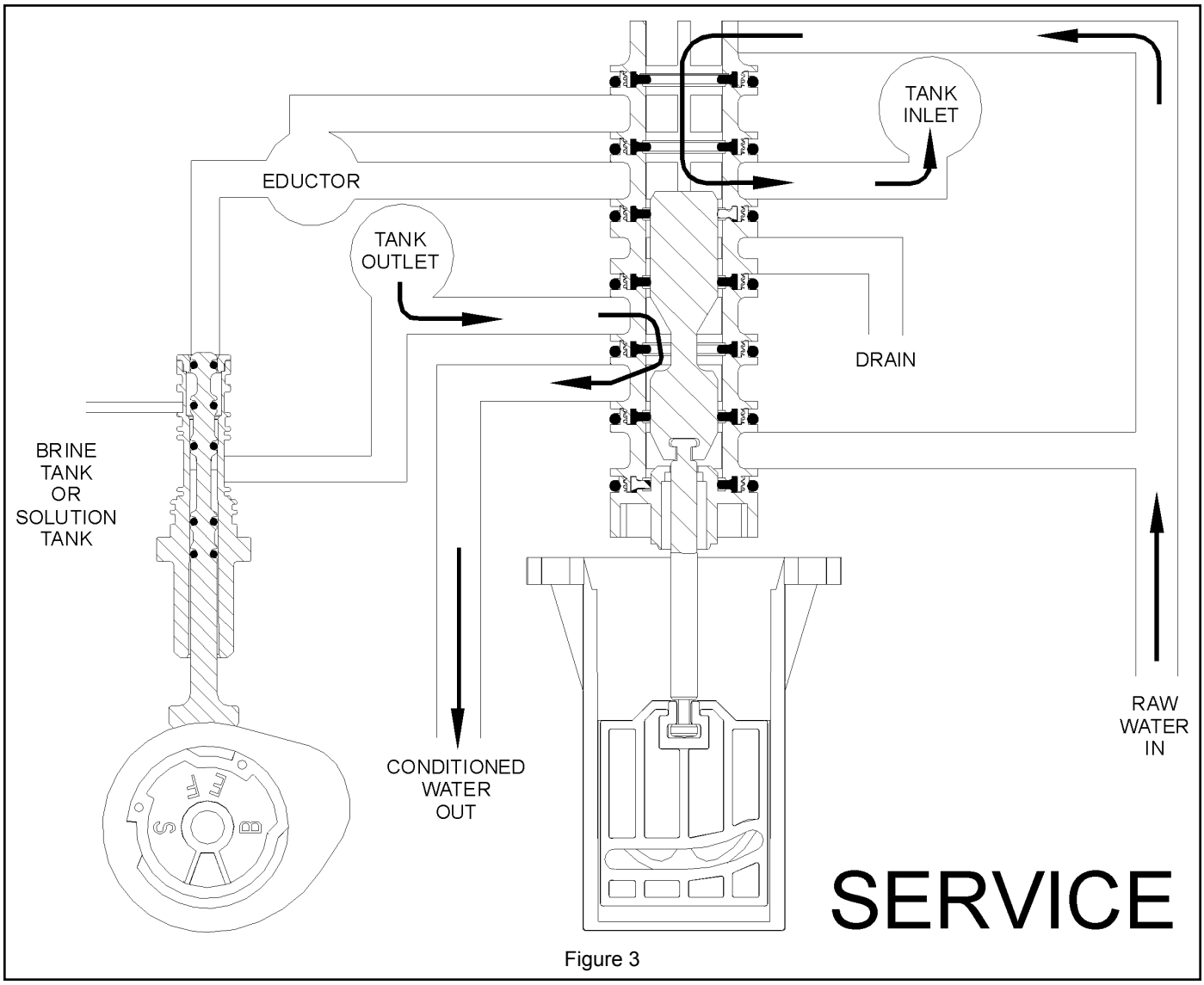


Figure 3

Backwash

Refer to Fig. 4

Raw water is directed down the center of the manifold, up through the resin, out the top of the tank to drain. The water to drain should be hard.

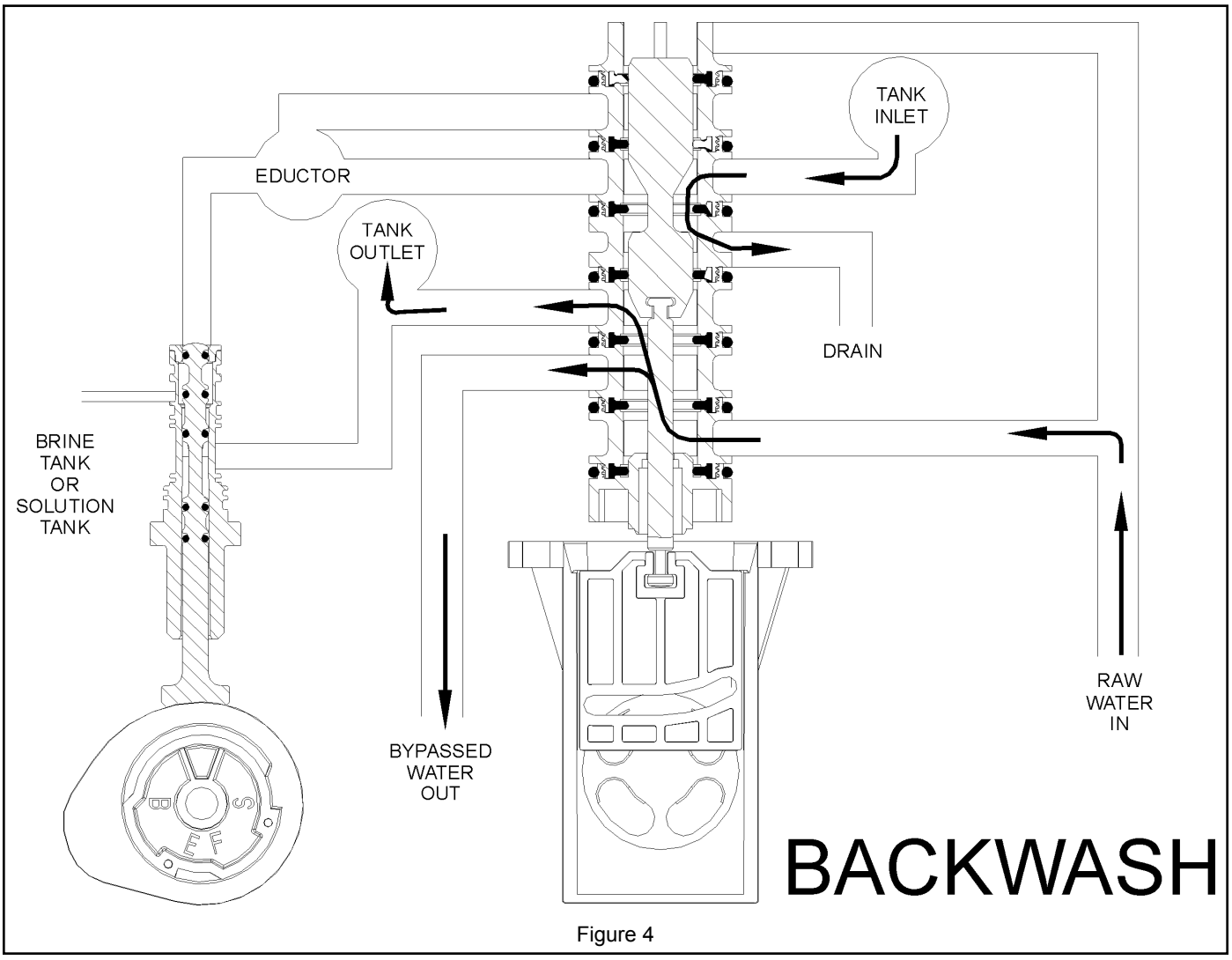


Figure 4

Regenerant Draw

Refer to Fig. 5

Raw water is directed from the inlet through the nozzle and into the throat. A vacuum is created and concentrated brine is educted (drawn). The raw water and concentrated brine combine, enter the mineral tank, and pass through the resin, up the manifold and to the drain. Once all of the brine has been educted and the brine valve seats, the unit goes into slow rinse. Hard water is allowed to service during regeneration.

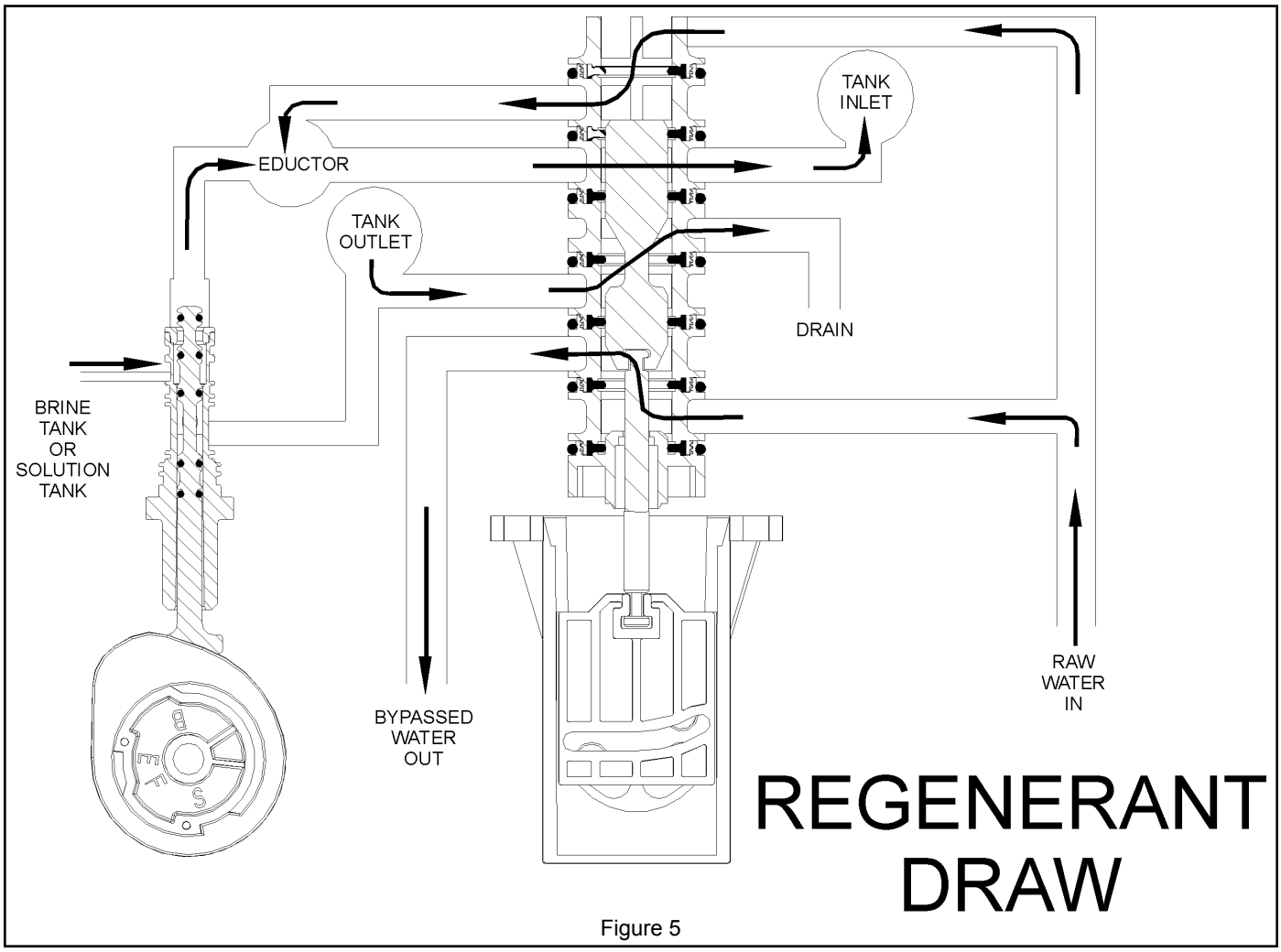


Figure 5

Slow Rinse

Refer to Fig. 6

Raw water is directed from the inlet through the nozzle and into the throat. A vacuum is created but the brine valve has seated, so no brine is educted. The raw water enters the mineral tank, passes through the resin, up the manifold and to the drain. Hard water is allowed to service during regeneration.

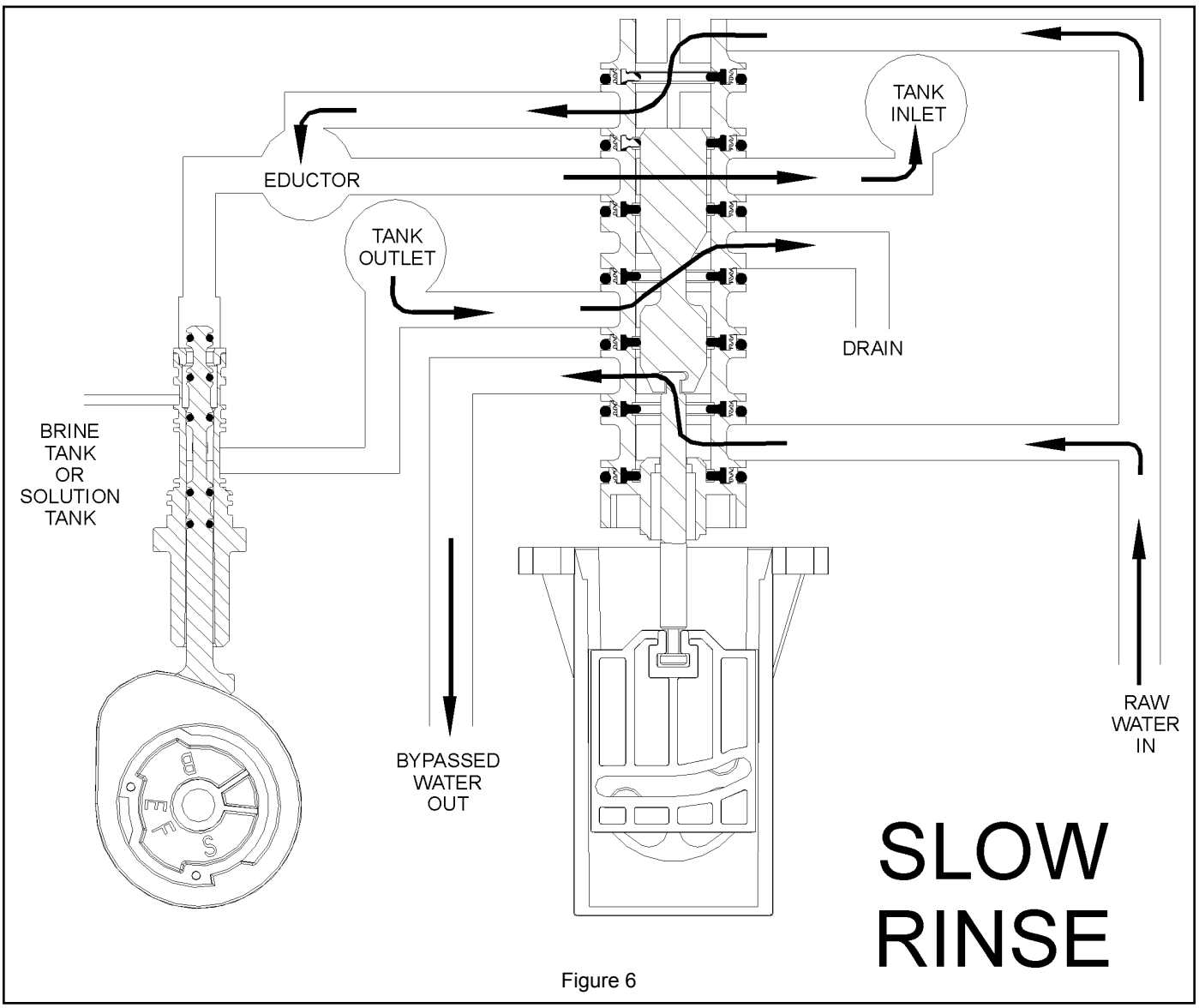


Figure 6

Fast Rinse / Refill

Refer to Figure 7

Raw water is directed from the inlet, through the eductor and inlet to the top of tank, down the resin, up the manifold, out to drain and brine line until the correct amount of water is in the brine tank. Hard water is allowed to service during regeneration.

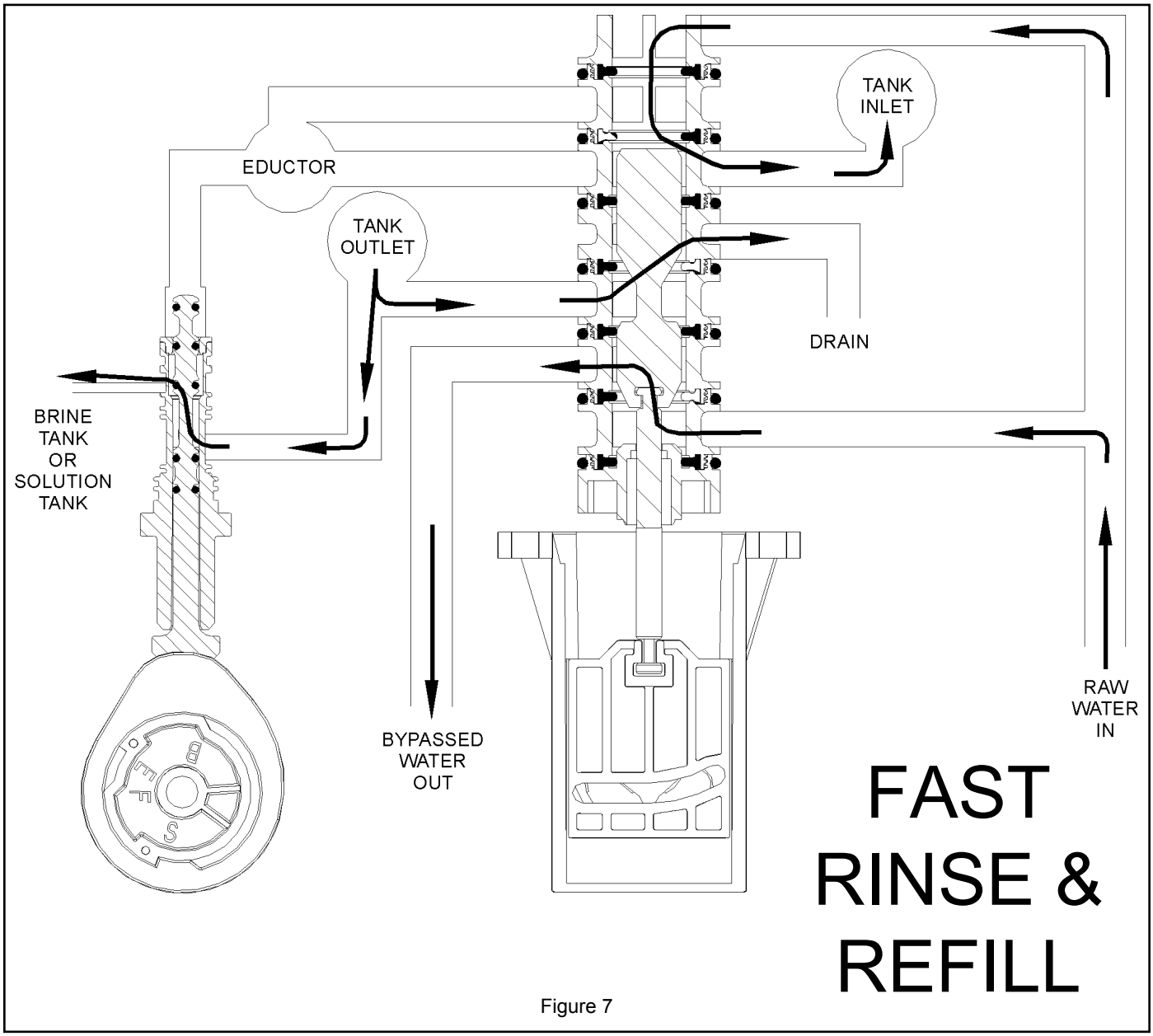


Figure 7

Controller Features

Control

The Culligan Medallist Series™ water softener. It can be programmed as either a time clock or Soft-Minder® meter model. Each model has its own programming parameters which can be set to control the operation and regeneration of the system. These functions are outlined in Table 1.

Table 1

Function	Time Clock	Soft-Minder Meter
Time of Day	YES	YES
Time of Regen.	YES	YES
Salt Dosage	YES	YES
Backwash Time	YES	YES
Brine Rinse Time	YES	YES
Regen. Interval / Gallons Capacity	YES	YES
Forced Regen. Interval	NO	YES*
Lock/Unlock display	YES	YES

* When Time Clock Backup is set to “ON”.

Circuit Board

The AccuSoft™ microprocessor circuit board controls every function of the Culligan Medallist Series® water softener. This board has several unique features which allows it to perform a variety of functions. Familiarization of the board is essential for a thorough understanding of the softener.

The AccuSoft circuit board has a set of default settings that the microprocessor will reset to whenever a meter is attached or removed from the control. Table 2 is a list of the default microprocessor settings.

It is recommended to always disconnect the power from the circuit board prior to replacing meter cable so that the programmed settings are not lost.

Table 2

Time of Day	12:00 P.M.
Time of Regeneration	2:00 A.M.
Salt Dosage	8 lbs.
Backwash Time	10 min.
Brine Rinse	60 min.
Regeneration Interval	3 days or 870 gallons
Display Lock Out	Disabled

Circuit Board

Refer to Figure 8 for all circuit board connections. Power terminals are located along the side edge of the circuit board. The connection marked 'MAIN' is for the main wire harness. The Soft-Minder connection is located in the upper left side of the board. Next to the meter connection is a connection marked 'BATT', which is for the optional battery back-up. All terminals are clearly marked to ease installation.

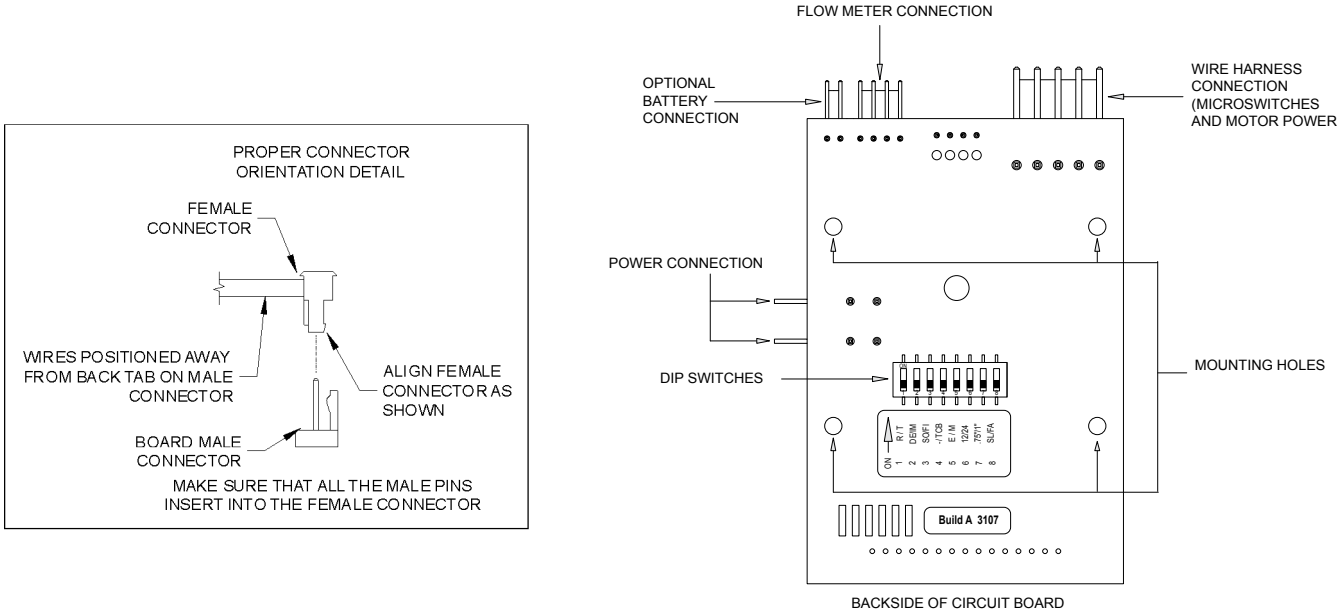

PROPER CONNECTOR ORIENTATION DETAIL
FEMALE CONNECTOR
WIRES POSITIONED AWAY FROM BACK TAB ON MALE CONNECTOR
ALIGN FEMALE CONNECTOR AS SHOWN
BOARD MALE CONNECTOR
MAKE SURE THAT ALL THE MALE PINS INSERT INTO THE FEMALE CONNECTOR
FLOW METER CONNECTION
OPTIONAL BATTERY CONNECTION
WIRE HARNESS CONNECTION (MICROSWITCHES AND MOTOR POWER
POWER CONNECTION
DIP SWITCHES
MOUNTING HOLES
Build A 3107
BACKSIDE OF CIRCUIT BOARD

Figure 8

Soft-Minder® Operation

The Soft-Minder meter utilizes a turbine impeller to accurately monitor the customer's water usage. After a predetermined amount of water has passed through the system, the microprocessor will signal a regeneration. The "REG" enunciator will light at this point. The unit will perform a standard regeneration cycle at the preset time, unless the programming option "dip 2" is changed from "Delayed" to "Immediate". When programming option "dip 2" is changed from "DEL" to "Id", a regeneration will begin immediately.

The programming of the Soft-Minder provides several settable variables, the Time-of-Day, Time-of-Regeneration, Salt Dosage, Backwash Time, Brine/Rinse Time, Gallons to Signal and Timeclock Backup, if active. Refer to the programming section for further information on programming the microprocessor.

Timeclock Operation

When the microprocessor is set-up as a time clock unit, the Culligan® Medallist control will regenerate at fixed intervals. The regeneration interval can be set anywhere from 1 to 99 days.

The programming for the time clock models is limited to Time-of-Day, Time-of-Regeneration, Salt Dosage, Backwash Time, Brine/Rinse Time, and the Regeneration Interval. Refer to the programming section for further information on programming the microprocessor.

Regeneration

There are several conditions that will cause the control to trip a regeneration. The “REG” enunciator will light when the control has signaled for a regeneration. The “REG” enunciator will flash while the control is in regeneration. The following are conditions that will call for regeneration, assuming “dip 2” has been set to “DEL”:

1. When the Soft-Minder meter has recorded the passage of a predetermined number or gallons
2. When the time clock has counted past the set number of days.
3. At the preset time, when the number of days without a regeneration is equal to the Timeclock Backup setting.
4. At the preset time, after the “REG” button is depressed once. “REG” will light.
5. Immediately, when the “REG” button is depressed for three seconds. “REG” will light and blink.
6. Immediately, if power to the unit has been off for more than 3 hours and time of day has been returned.

If “Dip Switch 2” is set to “Immediate”, the unit will begin a regeneration immediately for instances 1, 2, and 6. With “Dip Switch 2” set to “Delayed”, the regeneration will not begin until the preset regeneration time.

Note: *If set to immediate mode as timeclock or timeclock backup, the unit will initiate regeneration at 12:00 AM. In the delay mode, “REG” indicator will light at 12:00 AM and regeneration will occur at delayed time.*

Display Lockout

The Culligan Medallist Series™ control is equipped with a feature which will allow you to protect the programmed settings from tampering by unauthorized individuals. When the lockout feature is activated, the only parameters which can be adjusted are the Time-of-Day and the Time of Regeneration. Refer to the “Setting of the Microprocessor” for activating this feature.

Power Loss

The AccuSoft® circuit board is equipped with a Hi-Cap Capacitor and EEPROM memory chip. The capacitor is capable of maintaining the time, for at least two days (masked chip), in the event of a power outage. The EEPROM ensures that the individual programming parameters of the softener are not lost.

If the power outage lasts long enough to drain the Hi-Cap Capacitor, the control will flash “12:00 PM” when power is returned to the control. The unit will continue to keep time from the moment power is restored, and will initiate a full regeneration at the preset regeneration time. The time of day will need to be reset in order to return the regeneration to its preset time.

Placement

Refer to Figure 9 for system placement.

- Set the media tank on a solid, level surface near water, drain and electrical facilities. Place the outlet (black coupling) of the tank on the left.
- Set the brine system on a flat, smooth, solid surface as near the media tank as possible.

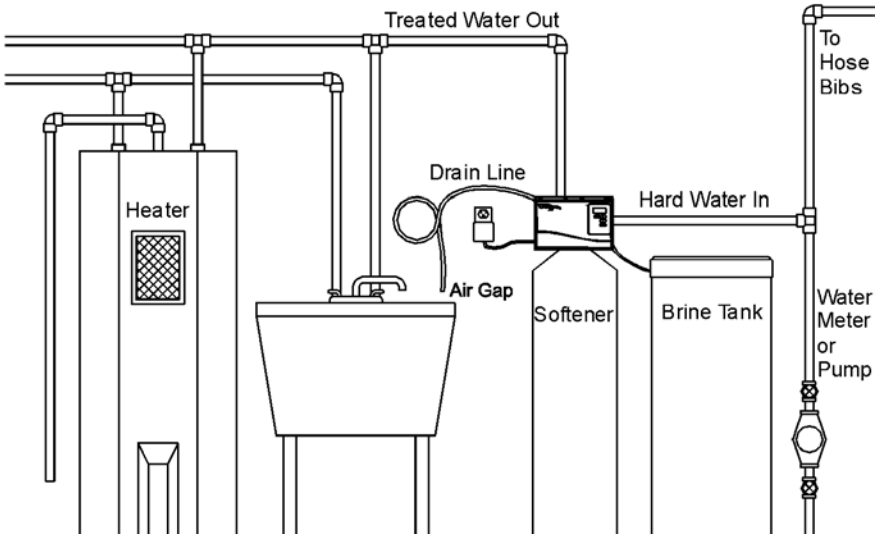


Figure 9

Mount The Control Valve - 3/4" Control

See figure 10 for a visual on mounting the control valve to the tank.

As shipped from the factory the Culligan Medallist Series® 3/4" control is equipped as a 8" unit.

1. Remove the two plastic caps from the tank couplings and lubricate the coupling O-rings with silicone lubricant.

   Note: *Do not use a petroleum base lubricant, for this will cause swelling of the rubber parts.*

   Note: *The black molded tank adapter is marked with "IN" and "OUT", corresponding to the inlet and outlet of the tank. Position the tank with the inlet coupling on the right and the outlet coupling on the left as you face the front of the tank.*

2. The control valve is marked also with "IN" and "OUT". Place the control onto the tank with the inlet and outlet of the control corresponding with the inlet and outlet of the tank. Press firmly onto the couplings.
3. Remove the two u-clamps and screws from the parts pack. Install the clamps on both sides of the control as indicated in Figure 10 and secure them with the screws.

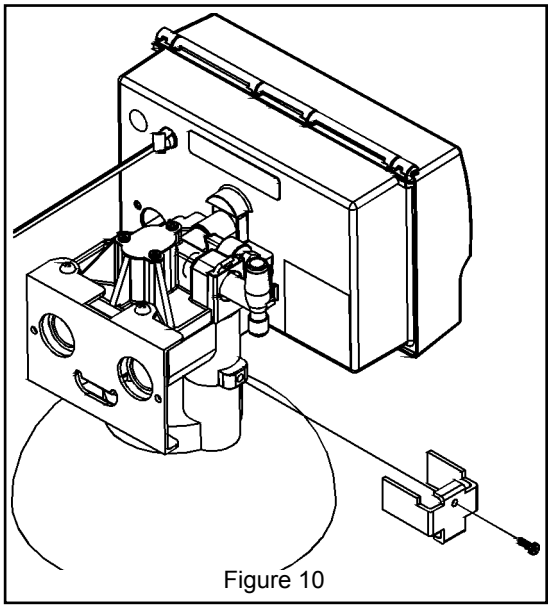


Figure 10

4. Peel off the protective film off the circuit board label.
5. Attach the appropriate Culligan Medallist Series data plate that's included in the small parts pack onto the back of the control (over the holes used for the solenoid valve).

Mount The Control Valve - 1” Control

See Figure 11 for a visual on mounting the control valve to the tank.

- Assemble the o-rings, located in the parts pack, to the tank adapter.
- The valve adapter o-ring sits on the first step on the adapter. See Figure 12.

> ***Note:*** *Do not push the top o-ring down to the flange surface on the adapter.*
>
> ***Note:*** *The larger of the two o-rings in the parts part goes between the adapter and the valve, do not stretch the smaller o-ring onto the top of the tank adapter.*

- Lubricate only the top o-ring on the tank adapter, and the outlet manifold o-ring with silicone lubricant.
- Screw the adapter into the tank until the adapter bottoms out on the tank flange.

> ***Note:*** *The adapter only needs to be tightened hand-tight to the tank flange.*

- Align the manifold with the center opening in the valve, and press the valve onto the adapter firmly.

> ***Note:*** *Make sure to push the valve straight down onto the manifold. If the valve is cocked, it may cause the o-ring to slip off the manifold.*

- Assemble the tank clamp to the control, and tighten the clamp screw.

> ***Note:*** *The clamp and valve will be able to rotate on the tank until pressure is applied. Do not try to rotate control valve if the clamp is tightened - you may cut the o-ring.*

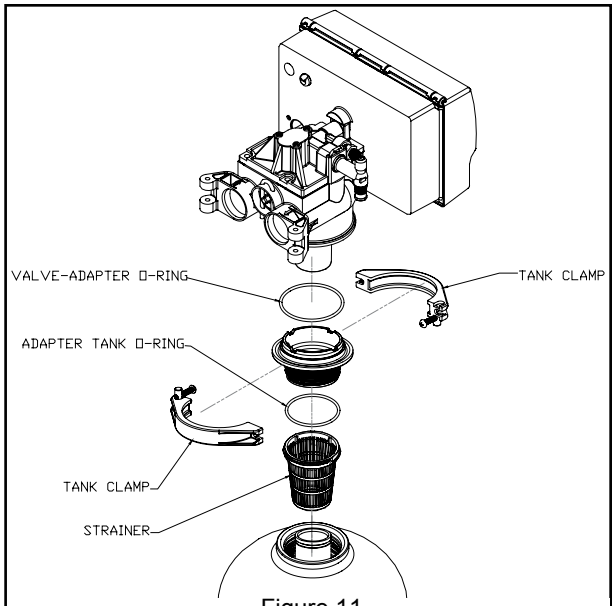


Figure 11

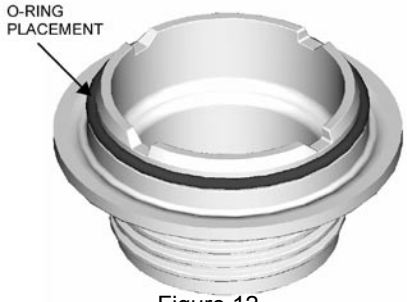


Figure 12

Flow Control and Eductor Nozzle

Listed below is the recommended eductor nozzle to be used at various salt dosages.

Unit	Backwash Flow	Nozzle	Throat	Brine Refill Flow
8”	#1, Black*	Blue*	Light Brown*	0.45 gpm
Medallist 30	#2, Brown*	Blue*	Light Brown*	0.45 gpm
Medallist 45	#2, Brown	@ 6 lbs - Blue Greater than 6 lbs - Beige	Light Brown	0.45 gpm
Medallist 60	#3, Green	Beige	Light Brown	0.8 gpm

* Standard from factory.

Refer to figure 13 for a visual on changing the eductor nozzle and the backwash flow control.

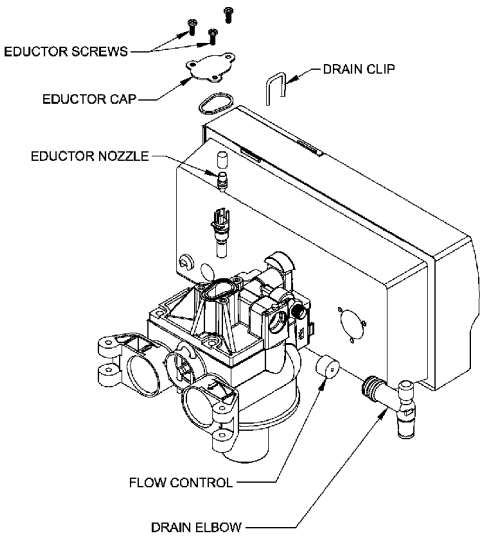


Figure 13

Eductor Nozzle Replacement:

- Remove the three screws on the eductor cap and remove the cap.
- Remove the eductor assembly.
- Remove the eductor screen from the assembly
- Remove the blue nozzle and replace it with the beige nozzle. Make sure to put the o-ring on the beige nozzle.
- Reverse the procedure to reassemble. To prevent leaks, ensure that the gasket is in the proper position.

Backwash Flow Control Replacement:

- Remove the drain clip and pull the drain elbow straight off.
- Remove the backwash flow control located behind the elbow.

> ***Note:*** *The number on the flow control should face into the valve body.*

- Reverse the procedure to reassemble.

Plumbing Connections

General Instructions

- Follow local plumbing & electrical codes. Failure to do so may result in your having to redo the installation at your expense.
- Take the time to make a clean, professional looking installation. Use flux and solder sparingly when making sweat connections, and avoid excessive use of pipe compound. When using galvanized pipe, clean out excess cutting oil and metal chips before assembly. Foreign objects, if allowed to enter the control valve, can cause operating problems.
- The main water supply line may then be reopened so that hard water will be available to the household throughout the remainder of the installation process. Set the Cul-Flo-Valve Bypass in the bypass position by screwing the stem all the way in against the body.

> **Caution!** Close the inlet supply line and relieve system pressure before cutting into the plumbing! Flooding could result if not done!

Bypass Connections

Shipped with each softener is a Culligan bypass valve, which is used to connect the softener to the plumbing system. The bypass allows the softener to be isolated from the water service line if service is necessary while still providing water to the home. The bypass valve can be directly plumbed into the system, or can be connected with the following optional sweat connection kits.

3/4” Medallist Control		Medallist Plus	
PN	**Description**	**PN**	**Description**
P1019783	3/4” Sweat Copper Adapter Kit	01010783	1” Sweat Copper Adapter Kit
P1019782	3/4” Elbow Sweat Copper Adapter Kit	01016564	3/4” Sweat Copper Adapter Kit
		01016565	3/4” Elbow Sweat Copper Adapter Kit

For installations in Massachusetts, Massachusetts Plumbing Code 248 CMR shall be adhered to. Consult your licensed plumber for installation of this system. This system and it’s installation must comply with state and local regulations.

> **Caution!** Close the inlet supply line and relieve system pressure before cutting into the plumbing! Flooding could result if not done!

> **Caution!** When making sweat connections, remove all plastic and rubber components which contact brass or copper. Damage to these components may result otherwise.

Bypass Valve Installation - 3/4” Medallist Time Clock Units Only

The bypass valve connects directly to the backplate of the valve with a pair of couplings and screws (Figure 14). To facilitate this connection, remove the plate by pulling up on the u-clip on the back of the valve. Lubricate all o-rings with silicone lubricant.

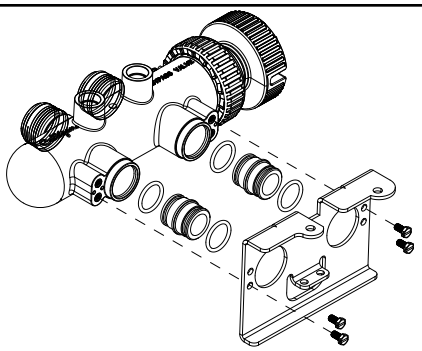


Figure 14

Bypass Valve Installation - 3/4” Medallist Soft-Minder® Meter Only

The Soft-Minder meter is placed between the bypass valve and the control in place of the couplings shipped with the Cul-Flo-Valv® (Figure 15). Make sure the meter is on the outlet port of the control and that it is installed with the arrow pointing in the direction of water flow. A pair of elongated bolts are packaged with the meter to hold the bypass valve to the back plate of the control. Lubricate all o-rings with silicone lubricant.

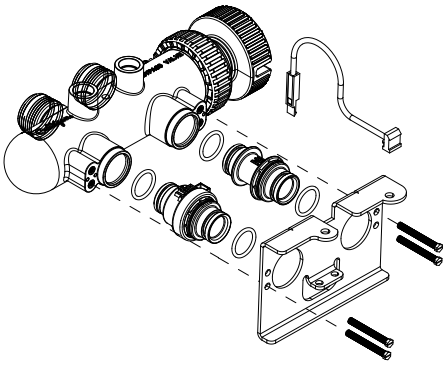


Figure 15

Caution! When reinstalling back plate to control valve, make sure the u-clip fully engages the two bottom holes of the bracket. Secure bracket from the top with the two mounting screws provided.

Bypass Valve Installation - 1” Medallist Plus Units

The bypass valve connects directly to the control valve with a pair of couplings and two assembly pins (Figure 16). Lubricate all o-rings on the couplings with silicone lubricant. On Soft-Minder® meter controls, the meter replaces the coupling on the outlet side of the control. The meter body fits in the same space as the coupling between the control valve and the bypass. Make sure that the arrow on the flow meter is pointing in the direction of flow (Figure 16).

Note: *If the ground from the electrical panel or breaker box to the water meter or underground copper pipe is tied to the copper water lines and these lines are cut during installation of the bypass valve, an approved grounding strap must be used between the two lines that have been cut in order to maintain continuity. The length of the grounding strap will depend upon the number of units being installed. In all cases where metal pipe was originally used and is later interrupted by the bypass valve to maintain proper metallic pipe bonding, an approved ground clamp c/w not less than #6 copper conductor must be used for continuity. Check your local electrical code for the correct clamp and cable size.*

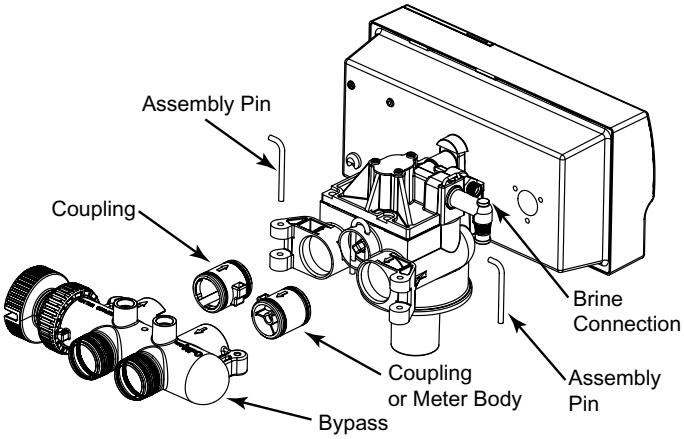


Figure 16

To bypass, turn the blue knob clockwise (see directional arrow on end of knob) until the knob stops as shown. DO NOT OVERTIGHTEN! (Figure 17a).

To return to service, turn the blue knob counter-clockwise (see directional arrow on the end of knob) until the knob stops as shown. DO NOT OVERTIGHTEN! (Figure 17b)

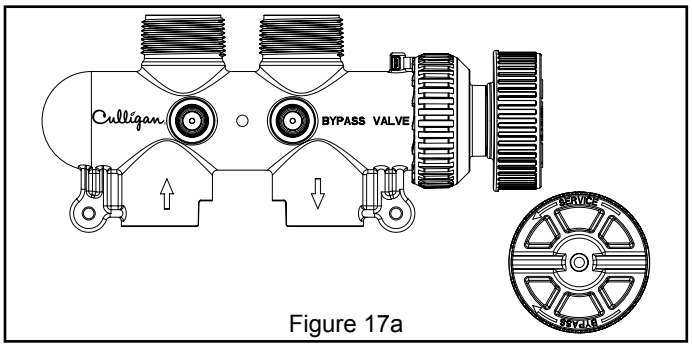


Figure 17a

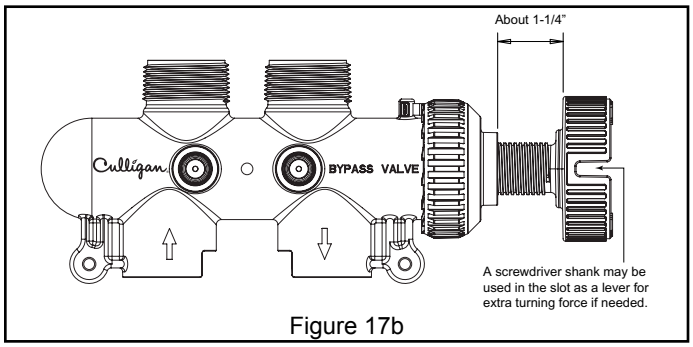


Figure 17b

Drain Line Connection

Refer to page 25 for drain line length and height limitations.

- Remove 1/2” pipe clamp from the small parts pack included with the control.
- Route a length of 1/2” drain line from the drain elbow to the drain.
- Fasten the drain line to the elbow with the clamp.
- Secure the drain line to prevent its movement during regeneration. When discharging into a sink, or open floor drain, a loop in the end of the tube will keep it filled with water and will reduce splashing at the beginning of each regeneration.

Note: *Waste connections or drain outlets shall be designed and constructed to provide for connection to the sanitary waste system through an air gap of 2 pipe diameters or 1 inch, whichever is larger.*

Note: *Observe all plumbing codes. Most codes require an anti-siphon device or air gap at the discharge point. The system and installation must comply with state and local laws and regulations.*

Connect the Brine Line

Refer to Figures 18 & 19.

- Measure a length of brine line sufficient to reach from the brine tank to the brine fitting, with no sharp bends. For easier access to the float it is recommended to add an extra four feet (1.3 meters) of length to the brine line. Cut both ends of the brine line squarely and cleanly.
- Remove the brine valve from the brine tank and then remove the white nut and insert from the float rod. Return float rod to its original position.
- Slip the white nut over one end of the tubing and press the plastic insert into the end of the tubing (Figure 19). Connect to the brine valve and tighten nut.
- Remove white nut and the plastic insert from the small parts pack.
- Slip the white nut over one end of the tubing and press the plastic insert into the end of the tubing (Figure 19). Connect to the brine connection on the valve and tighten nut (Figure 18).

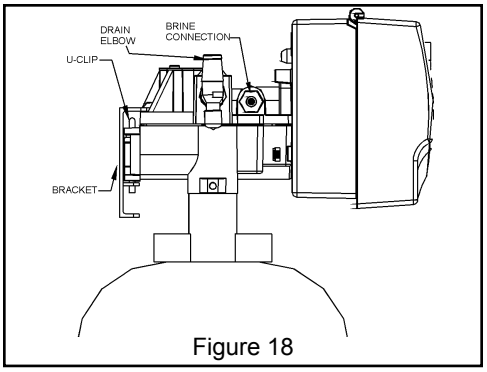


Figure 18

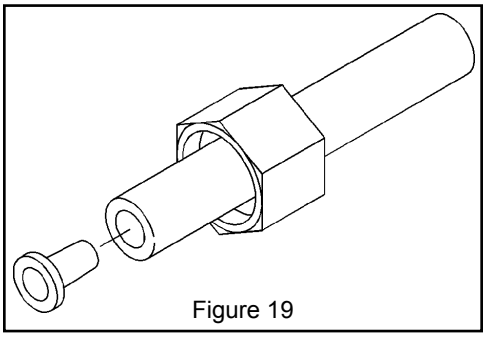


Figure 19

Soft-Minder® Meter Connection

To connect the meter leads refer to Figure 20 and proceed as follows:

- Lift up the timer case from the back plate.
- Remove the small plastic plug from the backplate.
- Slip the meter harness through the hole and toward the circuit board.
- Connect the harness to the circuit board. The Soft-Minder® meter terminal is labeled “FLOWMETER”.
- Pull any excess cable wire back out of the enclosure, and route the wiring inside the enclosure to avoid any interference with moving parts.
- Locate the strain relief bushing in the parts pack. Place it on the cable at the point of entry to the rear of the timer plate and push it into the hole.

Note: *The wire connectors must be connected to the circuit board properly. The wires must exit the plug-in connector opposite of the raised white base of the circuit board connector. Failure to properly connect any of the connectors will result in a malfunction of the circuit board operation.*

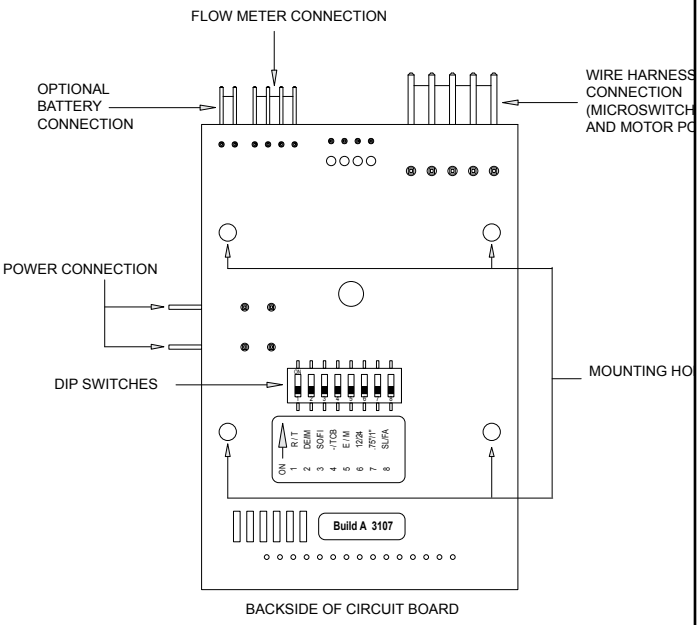


Figure 20

Electrical Connections

The power cord needs to be connected to the plug-in transformer, wire orientation is not critical. Figure 21 shows the cord attachment to the transformer. Connect wire harness to 24 VAC terminals on transformer.

Note: *Observe all state and local electrical codes.*

Note: *The plug-in transformer is rated for indoor installations only.*

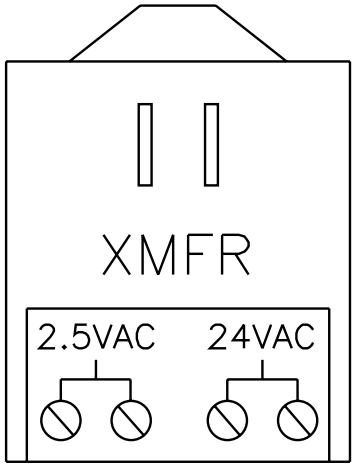


Figure 21

Table 3 - Maximum Allowable Drain Line Length

Height of Discharge Above Floor Level Operating						
Operating Pressure	**0 ft (0 m)**	**2 ft (0.6 m)**	**4 ft (1.2 m)**	**6 ft (1.8 m)**	**8 ft (2.4 m)**	**10 ft (3 m)**
30 psi (210 kPa)	60 ft (18 m)	50 ft (15 m)	30 ft (9 m)	15 ft (5 m)	Not allowable	Not allowable
40 psi (279 kPa)	100 ft (30 m)	90 ft (27 m)	70 ft (21 m)	50 ft (15 m)	30 ft (9 m)	12 ft (4 m)
50 psi (349 kPa)	145 ft (41 m)	115 ft (35 m)	80 ft (24 m)	80 ft (24 m)	60 ft (18 m)	40 ft (12 m)
60 psi (419 kPa)	Normal installation		100 ft (30 m)	100 ft (30 m)	85 ft (26 m)	60 ft (18 m)
80 psi (559 kPa)	Should not require more than				140 ft (43 m)	120 ft (37 m)
100 psi (699 kPa)	100 ft (30 m) of drain line					150 ft (46 m)

The microprocessor can be set in two distinct operation modes, Soft-Minder® meter or Timeclock. As shipped from the factory, the control is set for 8” Timeclock operation.

Soft-Minder® Operation

The Soft-Minder meter utilizes a turbine impeller to accurately monitor the customers water usage. After a predetermined amount of water has passed through the system, the microprocessor will signal a regeneration. The “REG” enunciator will light at this point. The unit will perform a standard regeneration cycle at the preset time, unless the programming option “dip 2” is changed from “DEL” to “Id”. When programming option “dip 2” is changed from “DEL” to “Id”, a regeneration will begin immediately.

The programming of the Soft-Minder provides several settable variables, the Time-of-Day, Time-of-Regeneration, Salt Dosage, Backwash Time, Brine/Rinse Time, Gallons to Signal and Timeclock Backup, if active. Refer to the programming section for further information on programming the microprocessor.

Time Clock Operation

When the microprocessor is set-up as a time clock unit, the Culligan Medallist Series™ control will regenerate at fixed intervals. The regeneration interval can be set anywhere from 1 to 99 days.

The programming for the time clock models is limited to Time-of-Day, Time-of-Regeneration, Salt dosage, Backwash Time, Brine/Rinse Time, and the Regeneration Interval. Refer to the programming section for further information on programming the microprocessor.

Settings

Capacity and Salt Settings

As mentioned previously, the softener will regenerate once the amount of water equal to the treated water volume set point has passed through the turbine for meter models or after a fixed time interval for timeclock models. Regeneration is either delayed until the selected regeneration time or immediate depending on how the microprocessor is programmed. Before completing the programming, the following information must be determined:

1. **Compensated Water Hardness. -** If your water supply contains iron, compensate for it by the following procedure:
   a. Multiply the iron by 0.1 and add the result to the hardness.
   Example: (3 ppm of iron x 0.1) + 25 gpg of hardness = 25.3 gpg of total hardness
   b. Choose the % capacity you want and refer to the table below for the appropriate multiplier.
   Example: 67% capacity gives a multiplier of 1.5.

Table 4

% Capacity	50%	67%	75%
Multiplier	2	1.5	1.33

   c. Multiply the result from Step 1 by the multiplier chosen in Step 2. This is the compensated hardness.
   Example: 25.3 gpg total hardness x 1.5 = 38 gpg compensated hardness.
   d. Use the effective hardness for sizing and to determine salt dosage and regeneration frequency.
   e. The forced regeneration feature should be used for Soft-Minder meter operation to ensure the resin bed does not become iron fouled due to lack of water flow. See “Programming the Option Settings” for the forced regeneration feature.

2. **Salt Dosage -** From Table 5, select the salt dosage at which the softener will be operated.
   a. Low Setting — Maximum salt efficiency, more frequent regeneration, reduced overall softening capacity.
   b. Medium Setting — Good combination of efficiency and overall softening capacity.
   c. High Setting — Maximum softening capacity, less frequent regeneration, and reduced salt efficiency. Recommended whenever iron is present and for hardness levels above 30 Grains Per Gallon, or high volume water usage.

3. **Treated Water Volume Set Point -** Calculate the treated water volume set point using the following information:
   a. Softening capacity — Grains (based upon salt dosage setting).
   b. Compensated hardness of water supply — Grains Per Gallon
   c. Estimated daily water usage — Gallons Per Day (refer to Table 5)

Table 5 - Daily Water Usage

Persons in Household	Gallons Per Day
2	150
3	225
4	300
5	375
6	450
7	525
8	600
9	675
10	750

Table 6 - Salt Dosage

Salt Dosage	Capacity				160 lb. Brine Tank "A" Dimension Secondary Only		250 lb. Brine Tank "A" Dimension				375 lb. Brine Tank "A" Dimension			
							Secondary		Primary		Secondary		Primary	
	8"	30	45	60	in.	(cm)	in.	(cm)	in.	(cm)	in.	(cm)	in.	(cm)
4	18,300	18,200	X	X	7-3/4	19.7	6-5/8	16.8	4-5/8	11.7	5-1/2	14.0	3-1/2	8.9
5	20,000	21,300	X	X	9-1/2	24.1	8	20.3	6	15.2	6-1/2	16.5	4-1/2	11.4
6	22,000	23,800	26,500	X	11-1/4	28.6	9-3/8	23.8	7-3/8	18.7	7-1/2	19	5-1/2	14
7	23,200	25,800	29,500	32,600	13	33	10-7/8	27.6	8-7/8	22.5	8-1/2	21.6	6-1/2	16.5
8	24,100	27,600	31,900	36,000	14-3/4	37.5	12-1/4	31.1	10-1/4	26	9-1/2	24.1	7-1/2	19
9	25,100	29,100	33,900	39,000	16-1/2	42	13-5/8	34.6	11-5/8	29.5	10-1/2	26.7	8-1/2	21.6
10	26,100	30,200	35,600	42,300	18-1/4	46.3	15	38.1	13	33	11-1/2	29.2	9-1/2	24.1
11	26,800	31,000	37,300	45,300	20	51	16-3/8	41.6	14-3/8	36.5	12-1/2	31.7	10-1/2	26.7
12	27,500	32,000	38,900	48,000	21-3/4	55.2	17-3/4	45.1	15-3/4	40	13-1/2	34.3	11-1/2	29.2
13	X	X	40,500	50,700	21-1/2	59.7	19-1/8	48.6	17-1/8	43.5	14-1/2	36.8	12-1/2	31.7
14	X	X	41,900	53,100	25-1/4	64.1	20-1/2	52.1	18-1/2	47	15-1/2	39.4	13-1/2	34.3
15	X	X	43,100	55,500	X	X	21-7/8	55.5	19-7/8	50.5	16-1/2	42	14-1/2	36.8
16	X	X	44,400	57,800	X	X	23-1/4	59	21-1/4	54	17-1/2	44.5	15-1/2	39.4
17	X	X	45,500	59,700	X	X	24-5/8	62.5	22-5/8	57.5	18-1/2	47	16-1/2	42
18	X	X	46,800	61,600	X	X	26	66	24	61	19-1/2	49.5	17-1/2	44.5
20	X	X	X	64,500	X	X	28-3/4	73	26-3/4	68	21-1/2	54.6	19-1/2	49.5
22	X	X	X	66,000	X	X	X	X	X	X	23-1/2	59.7	21-1/2	54.6
24	X	X	X	67,900	X	X	X	X	X	X	25-1/2	64.8	23-1/2	59.7
26	X	X	X	69,100	X	X	X	X	X	X	27-1/2	69.9	25-1/2	64.8
28	X	X	X	70,300	X	X	X	X	X	X	29-1/2	74.9	27-1/2	69.9
30	X	X	X	71,700	X	X	X	X	X	X	31-1/2	80	29-1/2	74.9

Example - Meter: Softener Model Medallist 2M

Capacity @ 9 lb. Salt Dosage: 25,100 Grains
Compensated Water Hardness: 19 Grains Per Gallon
Estimated Daily Water Usage: 300 Gallons Per Day

Treated Water Volume Set Point = Softener Capacity / Compensated Hardness - Water Usage

Softening Capacity	25,100	Grains
Divide by Compensated Hardness	÷ 19	Grains per Gallon
Result is total number of gallons of soft water per regeneration	1,321	Gallons
Subtract daily Water Usage (needed as a reserve to ensure continuous soft water until regeneration occurs).	- 300 1,021	Daily Water Usage (One Day Supply) Gallons
Round down to nearest ten for Treated Water Volume Set Point	1,020	Gallon Setting

Set "CAPG" to 1020

Example - Timeclock: Softener Model Medallist 2

Capacity @ 9 lb. Salt Dosage: 25,100 Grains
Compensated Water Hardness: 19 Grains Per Gallon
Estimated Daily Water Usage: 300 Gallons Per Day

Treated Water Volume Set Point =	Softener Capacity / Compensated Hardness	- Water Usage
Softening Capacity	25,100	Grains
Divide by Compensated Hardness	÷ 19	Grains per Gallon
Result is total number of gallons of soft water per regeneration	1,321	Gallons
Subtract daily Water Usage (needed as a reserve to ensure continuous soft water until regeneration occurs).	- 300 1,021	Daily Water Usage (One Day Supply) Gallons
Divide by daily water usage	÷ 300	
	3.4	Days
Round down to nearest day	3.0	Days

Set "CAP" to 3

Use the following worksheets to calculate and record the proper settings.

Treated Water Volume Set Point Work Sheet - Meter Models

1.	Enter Softening Capacity		_____
2.	Divide by Compensation Hardness ÷		_____
	Result is Total Gallons of Soft Water Per Regeneration	=	_____
3.	Subtract Daily Water Usage (Reserve	-	_____
	Result) =		_____
	Round down to nearest ten for Treated Water Volume Set Point		Gallons

Treated Water Volume Set Point Work Sheet - Timeclock Models

1.	Enter Softening Capacity		_____
2.	Divide by Compensation Hardness ÷		_____
	Result is Total Gallons of Soft Water Per Regeneration	=	_____
3.	Subtract Daily Water Usage (Reserve)	-	_____
4.	Divide by Daily Water Usage	÷	_____
	Result =		_____
	Round down to nearest ten for days between regeneration set point		Days

Note: *All Softening capacity is based on new resin and using sodium chloride as the regenerant: If potassium chloride is used reduce the rated softening capacity by 20%.*

Fill the Salt Storage Container

Fill the salt storage container with water until the level reaches about 1 inch above the salt support plate. Pour salt into the container. Fill with salt to within a few inches of the top.

Brine Valve “A” Dimension

The Culligan Medallist Series® unit contains a brine float which can serve as a backup refill shutoff in the event of a failure, such as a power outage when in the refill position. The float level should be set based on the salt dosage setting. Refer to figure 22.

- Remove nut retaining brine valve to brine chamber.
- Lift the brine valve from the brine chamber.
- Find the correct “A” dimension from Appendix A, Table 5.
- Set the distance from the top of the filter screen to the base of the float accordingly. The slight difference in height when the float is pulled up or down is negligible.
- Re-install into brine chamber and replace nut.

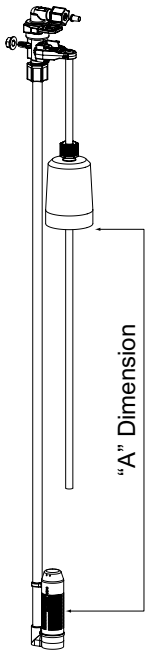


Figure 22

Programming

Dip Switch Definitions

The circuit board is shipped with all DIP switches in the off position. Prior to programming the controller some DIP switches may need to be moved to the ON position. Because each switch serves a specific purpose, please review the following information, moving the required switches to an ON position as necessary for each controller in the system. The definitions and purpose are as follows:

Switch #	Abbreviation	Definition	Purpose
1	R / T	Run / Test	Off - Allows controller to function in a normal, operational mode.
			On - Places controller in test mode to verify operation of the board components & software.
2	D / I	Delayed / Immediate	Off - Regeneration will occur at Delayed Time of Day upon a controller receiving a valid regeneration initiation signal.
			On - Regeneration shall occur immediately upon a controller receiving a valid regeneration initiation signal, regardless of the time of day.
3	SO / FI	Softener / Filter	Off - The unit shall be operated as a softener.
			On - The unit shall function as a filter. The default time programmed for cycle #2 shall be 2 minutes.
4	- / TCB	Time Clock Back-up Disabled / Enabled	Off - The time clock backup option is not enabled.
			On - Allows the user to enable the time clock function of the control as a backup regeneration initiation option. This feature is used as a back up to a primary device such as a flow meter.
5	E / M	English / Metric	Off - The unit will function in standard English dimensions.
			On - The unit will function in standard metric dimensions.
6	12 / 24	12 Hour Clock / 24 Hour Clock	Off - All time keeping functions shall be based on an AM/PM basis. The PM icon shall be lit in the display as appropriate.
			On - Time keeping functions shall work on a 24-hour clock (military time). The AM/PM display icons will be disabled.
7	.75 “ / 1”	3/4” / 1” Control	Off - 3/4” Medallist Control Valve
			On - 1” Medallist Plus Control Valve
8	S / F	Standard Refill / Fast Refill	Off - The 0.45 gpm refill flow control is used to control the refill flow rate. Set in the off position for 8” and 10” units.
			On - The 0.80 gpm refill flow control is used to control the refill flow rate. Set in the on position for 12”

The programming menu for Medallist is outlined in the following table:

Setting	Display	Range Limits	Default	Comments
Time of Day		12:00 AM - 11:59 PM (12hr) 00:00 - 23:59 (24hr)	12:00 PM 12:00	12 / 24 hour function set with dip #6
*Time of Regeneration		12:00 AM - 11:30 PM (12hr) 00:00 - 23:30 (24hr)	2:00 AM 02:00	- Adjust time in 30 minute increments only -Always active UNLESS dip #2 is on AND dip #4 off
*Regeneration Interval		Days - 01 to 99 days	03 days	Only active if dip #4 is on
*Salt Dosage		0.5 - 60 lbs (English) 0.5 - 27.5 kg (metric)	8 lbs	- Not active in filter mode
*Cycle 1 time		01 - 99 minutes	10 minutes	-Always active in Flow Meter Mode
*Cycle 2 time		01 - 99 minutes	- Softener: 60 minutes - Filter: 02 minutes	- In filter mode, default is 2 minutes
*Batch capacity Set Point		1 - 9,999	870	- Not active in time clock mode.

Hidden Programming Menu

(Accessed from service mode by holding the “+” key for 5 seconds)

*Delay / Immediate		Toggle Delay or Immediate	Delay	- Locks in a regen signal after a 3 hour or more power outage; regen can be set to go immediate or delay until the tor; - Only accessible from service mode, time of day display, by pressing and holding “+” for 5 seconds - (**not in programming menu**)
*Lock / Unlock		Toggle Lock & Unlock	Unlock	- Lock or unlock access to make program changes - Only accessible from service mode, time of day display, by pressing and holding “+” for 5 seconds - (**not in programming menu**)

• To be saved in EEPROM

Make sure either inlet water supply is turned off, then supply power to the timer. The display will power up flashing “12:00 PM” and the motor will energize and cycle the control, without stopping, the home position. This is required to ensure that the control is in the home position.

The timer uses four buttons:

Button	Description
Set-up / Enter Key (Status)	Advance timer through display options
Regeneration Key (REGEN)	Initiate a regeneration
Toggle Down Key (“-”)	Decrease the setting
Toggle Up Key (“+”)	Increase the setting

Time of Day

This setting is used to program the current time of day. When in this step the display will first show “tod” for two seconds.

After “tod” is displayed, “12:00 PM” will display (or the current set time if already programmed) and the minutes will flash.

- The minutes are adjusted with the “+” or “-” key until the correct value is displayed.
- Press the “Regen” key to flash the hours. Adjust with the “+” or “-” key until the correct time is displayed.

Pressing the “Status” key will move to the next programming step. Pressing “Regen” will move back to the minutes adjust.

Time of Regeneration

This setting is used to program the time at which a regeneration is to occur in the delay mode, or in immediate mode with time clock backup on. The display will first show “tor” for two seconds.

After “tor” is shown the display will then show the default of 2:00 AM (or the current programmed time of regeneration if already set). The time can be adjusted in 30 minute increments by pressing the “+” or “-” keys.

Pressing the “Status” key will save the setting and move to the next programming step.

Regeneration Interval (Time Clock Mode)

This setting is used to set the days between regeneration in time clock mode. The display will show “REG” icon and “dAY” for two seconds and then display the numbers to change. Adjust the value with the “+” or “-” keys.

Pressing the “Status” key will save the setting and move to the next programming step.

Regeneration Interval (Time Clock Back-up)

This setting is used to set the days between regeneration when time clock back-up is activated in a meter mode. It is activated in meter mode if the time clock backup DIP switch #4 is set to on. The display will show the REG icon and tcb" for two seconds and then the number of days. Adjust the value with the "+" or "-" keys. Pressing the "Status" key will save the setting and move to the next programming step.

Salt Dosage

This settings used to set the salt dosage. The display will first show "SLtP" (SLtG for metric according to DIP switch #5 setting) for two seconds and then display the default (or previously programmed value). Adjust the salt dosage with the "+" or "-" keys.

Pressing the "STATUS" key will save the setting and move to the next programming step.

Backwash Time

This setting is used to program the cycle 1 time that is usually backwash. The time of the cycle is kept in minutes. The display will show "buu" in the display for two seconds and then the cycle time in the right most digits. Adjust the value with the "+" or "-" keys.

Pressing the "Status" key will save the setting and move to the next programming step.

Brine Draw / Slow Rinse Time

This setting is used to set the time in minutes for cycle 2. This cycle is usually brine draw / slow rinse for softeners and a settling time for filters. The display will show "br" in the left most digits and the cycle time in the right most digits. Adjust the value with the "+" or "-" keys. See Table 8 for suggested brine draw / slow rinse times.

Pressing the "Status" key will save the setting and move to the next programming step.

Batch Set Point

This setting is used to set the trip point for regeneration when in flow meter operation. It will only appear if a flow meter is connected. The programmed setting displays the actual set point to trigger regeneration. The display will show the REG icon and “CAPG” (or “CAPL for metric) for two seconds and then display the “REG” and the setting numbers to adjust. Adjust the value with the “+” or “-” keys.

Pressing the “Status” key will save the setting and move to the next programming step.

Blank Display

After the last programming menu is displayed (menu will vary depending on mode of operation), pressing status will move to a blank display screen.

From the ‘blank display’, pressing the “+” key from the blank display will enter the diagnostics menu.

From the ‘blank display’, pressing the “-” key will enter the statistics menu.

From the ‘blank display’, pressing the “Status” key will exit programming mode and return to the service mode time display.

The “regen” key is ignored while in the ‘blank display’.

Hidden Programming Menu

(Accessed from the regular time of day display in service mode by holding the “+” key for 5 seconds).

Immediate Regeneration Override

This setting is used to determine whether an immediate or delayed regeneration should occur after a power outage greater than 3 hours. It applies only when dip #2 is set for “delay”. The display will show the REG icon and “dEL” or Id” depending on the last saved setting (default to “dEL” if EEPROM has no saved value). Toggle between “dEL” and “Id” with the “+” or “-” key.

If set to “dEL”, then after power outage greater than 3 hours the “regen” icon will light and the regeneration will begin when the timer reaches the next programmed time of regeneration.

If set to “Id”, then after a power outage greater than 3 hours the regeneration will begin as soon as the control completes the homing cycle.

Pressing the “Status” key will save the setting and go to the next Hidden Menu setting.

Screen Locking

This setting is used to lock out the user from changing most of the program menu settings. When the “Loc” setting is saved, the only program menus that can be changed are “tod” and “tor”. The program menu settings will appear as normal but their values will not be able to be changed. (Note: The hidden menu can always be accessed and settings within the hidden menu can always be changed, even if “locked”.)

The display will show “Loc” or UnL” depending on the last saved setting (default to “UnL” if EEPROM has no saved value. Toggle between “Loc” and UnL” with the “+” or “-” keys.

Pressing the “Status” key will save the setting, exit the Hidden Menu and return to the regular time of day Service Mode display.

Table 8 - Suggested Brine Draw / Rinse Times

Salt Dosage	Brine Draw/Slow Rinse Time (Minutes)		
	8” Tank	10” Tank	12” Tank
3	53	X	X
4	55	X	X
5	57	40	X
6	59	42	X
7	62	44	40
8	65	46	41
9	68	48	43
10	71	50	44
11	74	52	45
12	76	53	46
13	78	55	48
14	80	56	49
15	82	58	50
16	X	59	51
17	X	61	52
18	X	62	54
19	X	64	55
20	X	65	56
21	X	67	57
22	X	68	58
23	X	70	60
24	X	71	61
25	X	X	62
26	X	X	63
27	X	X	65
28	X	X	66
29	X	X	67
30	X	X	68

Note: *Values are for 50 psi pressure. Minutes should be adjusted for lower and higher pressures to ensure that the brine is fully rinsed out.*

Manual Cycling

Manual Control Cycling

The control can be manually cycled through a regeneration to troubleshoot the control or verify that the set-up is complete. When a control is manually cycled back to the service position, the statistical counters of capacity remaining, days since last regeneration and the number of regenerations is in the last 14 days and the life of the unit are not to be reset or updated. If the control is allowed to time out from the last position back to service (Home), the applicable statistical counters are to be reset or updated. A manual cycling of the control can be accomplished by following the steps as outlined below.

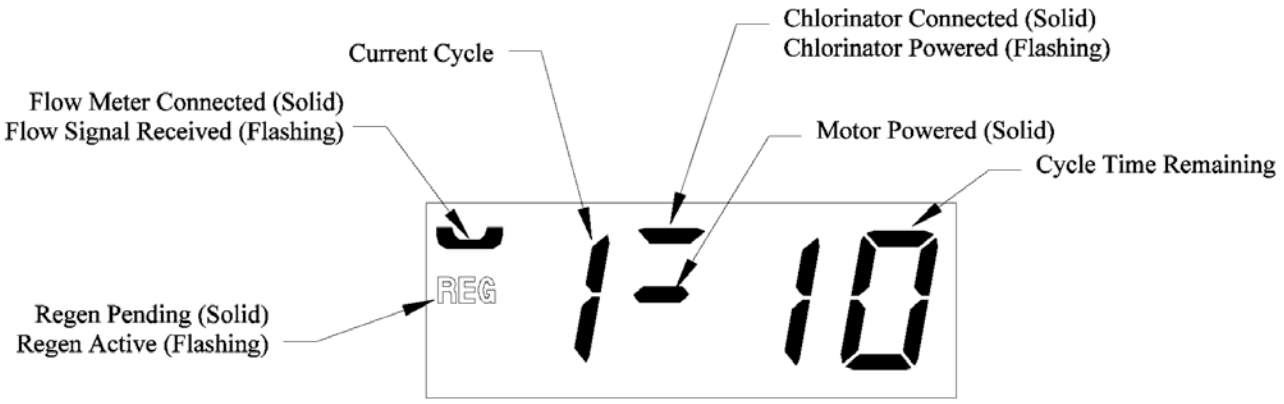
1. While in the service mode, press the “Status” key until the display goes blank.
2. Press the “+” key to display the current motor position.
3. Press and hold the “Regen” key for 5 seconds until the regeneration is started. Once regeneration is active, the “Regen” key will be ignored until the control returns to the service or “home “ position.
4. The “REG” icon will flash and the motor will move the control to Backwash position.
5. Press the “+” key to cycle to the next position and remain there until the cycle times out or the control is manually indexed.
6. Continue to press the “+” key until the control returns to the service (Home) position. In order to step through the cycles again, repeat at step 3.

Note: if the “-” key is pressed at any time, the control will move back to the first item in the statistics menu. Pressing the “+” key from the statistics menu would move the display back to the current diagnostic cycle. The “+” key will be ignored once the control returns back to the home position.

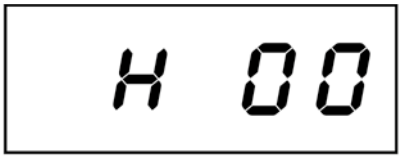
While cycling the control basic diagnostics can be accomplished.

- The display shows the “REG” icon solid (if a regeneration is pending) or flashing (if in regeneration).
- The display is to show the current cycle (“H” for service, “1” for Backwash, “2” for Brine Rinse and “3” for Fast Rinse / Refill) in the left most segment.
- The status of the motor output is to be shown in the 3rd digit from the right. The center bar of the digit will light solid and the LEDs will turn off when the motor output is on.
- The cycle time remaining will be displayed in the two right most end digits.
- If a flow meter is attached, the phone icon will show solid and flash if the control is getting a flow signal form the flow meter.

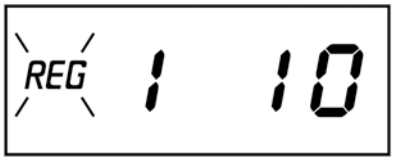
If a chlorinator is attached, the top bar of third digit from the right will show solid and flash when the chlorinator (low, med, or high) signal is present.



1. Press the status button to move past the programming steps until the display is blank. From blank display press the “+” key. An “H” will appear in the display. The control is in the HOME position.

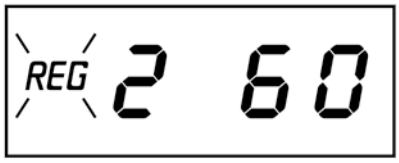


2. Press and hold the regen button. The ‘REG’ icon will blink, and the motor will advance the control. A ‘1’ will appear. The unit is now in the BACKWASH position. The numbers to the right indicates the time remaining for the cycle.



3. Press the “+” key. A ‘2’ will appear in the display, along with the cycle time remaining. The control is in the BRINE DRAW/SLOW RINSE cycle.

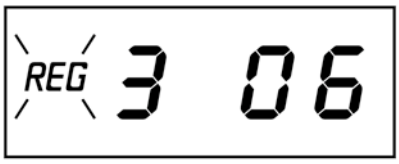
4. Press “+” key. A ‘3’ will appear in the display, along with the cycle time remaining. The control is now in the FAST RINSE/BRINE REFILL cycle.



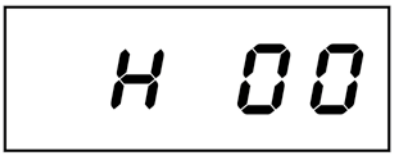
5. Press the “+” key. An ‘H’ will appear in the display. The unit is in the HOME position. The ‘REG’ enunciator is no longer blinking.

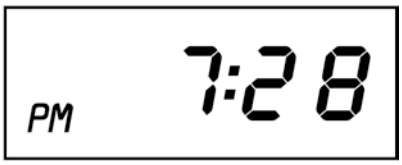
6. Press the status key. Time-of-Day appears in the display.

   Note: *If the “+” key is pressed to cycle the value from position “3” to “Home”, the # regen counters will not be updated.*



The control can be indexed through the various regeneration stages. For all steps, the cycle numbers do not appear or change, until the motor stops.





Service Check

The service mode allows one to view the instantaneous flow rate, the gallons remaining before the softener signals for regeneration, the number of regenerations in the past 14 days, the total number of regenerations the control has cycled through and the number of days since the last regeneration.

The statistical functions are reached by pressing the “Status” key until the screen blanks and then pressing the “-” key. Repetitive presses of the “-” key will cycle through the statistics mode. Pressing the “Status” key will exit statistics and move to the time display. The following table outlines the statistic function display, range limits and default setting:

Display	Range Limits	Comments
Flow Rate	0 to 999.0	Based on “K” factor setting, updated a minimum of every 6 seconds (**Only active with Flow Meter attached**).
•Capacity Remaining (gal / L) (Meter Mode)	0 - 9,999	Remaining gallons (liters) until batch capacity is reached. Update display a minimum of every 6 seconds (**Only active with Flow Meter attached**).
• Number of Regenerations - Last 14 days	0 to 99	- Days counter is to be updated at 12:00 AM **ONLY** when dip #2 is on **AND** dip #4 is off; Otherwise update at whatever TOR is set for - Number of Regeneration is to be updated after a valid regeneration is complete (cycle 3 times out automatically)
• Number of days since last Regeneration	0 to 99	- Days counter is to be updated at 12:00 AM **ONLY** when dip #2 is on **AND** dip #4 is off; Otherwise, update at whatever TOR is set for - After a valid regeneration is complete (cycle 3 times out automatically), the counter is to be reset to 0
• Number of Regenerations - Life of the Unit	0 to 9,999	Counter is to be updated after completion of valid regeneration cycle (cycle 3 times out automatically)

• To be saved in EEPROM before the control is powered down during a power outage.

Once the statistics menu is entered the information shown for each display is outlined below:

- “Regen” key is always ignored in statistics mode;
- Can enter directly into diagnostics mode by pressing the “+” key;
- When returning to statistics mode directly from diagnostics mode, always display the first statistic in the list as if statistics mode was entered for the first time (don’t have to remember where it left off in the list);
- Can exit back to service mode by pressing the “status” key;
- Automatically times out back to service mode after 10 minutes of no key press activity - EXCEPT for “flow rate” and “capacity remaining”; when displaying “flow rate” and “capacity remaining” the control can stay in statistics mode indefinitely;
- Drop all leading zeros;

Flow Rate

This display will only show if the flow meter is attached to the control. The display shall show the current flow rate of the water passing through the control. The display will show “FLO” for two seconds and then the current flow rate passing through the flow meter until a key is pressed.

This display shall never time out, as opposed to the rest of standard statistics (10 minutes).

Capacity Remaining (gal/ L)

This display will only show if the flow meter is attached to the control. The display shows the gallons or liters of capacity remaining in the batch before regeneration will be triggered. The display will show “GALr” (“Litr” for metric) for two seconds and then display the remaining capacity. When reaching “0” the display will remain at “0” and not show negative values.

This display shall never time out, as opposed to the rest of standard statistic (10 minutes).

Number of Regenerations in Last 14 Days

This display will show the number of regenerations that have occurred in the last 14 days. The display will first show “14dY” for two seconds and then display the number of valid regenerations that have occurred.

Number of Days since Last Regeneration

This display shows the number of days that have elapsed since the last regeneration. The display will show “dAYS” for two seconds and then the number of days that have elapsed since the unit completed its last valid regeneration.

Total Number of Regenerations for Life of Unit

This display will show the total number of regenerations that have occurred since installation. The display will show “totL” for two seconds and then display the total number of valid regenerations for the life of the unit.

Statistical Function Timeout

If no key activity occurs for a period of 600 seconds (10 minutes) while in statistics functions mode, the mode will time out and return to the time of day display. An exception is that the flow rate and capacity remaining will not time out but will remain displayed until a key is pressed. Pressing the “Status” key at any time will return he unit back to the time display.

Final Start-Up

Regeneration

There are several conditions that will cause the control to trip a regeneration. The “REG” enunciator will light when the control has signaled for a regeneration. The “REG” enunciator will flash while the control is in regeneration. The following are conditions that will call for regeneration:

1. When the Soft-Minder® meter has recorded the passage of a predetermined number of gallons.
2. When the time clock has counted past the set number of days.
3. At the preset time, when the number of days without a regeneration is equal to the Timeclock Backup setting.
4. At the preset time, when the “REGEN” button is depressed once. “REG” will light.
5. Immediately, when the “REGEN” button is depressed for three seconds. “REG” will light and blink.
6. Immediately, if power to the unit has been off for more than 3 hours and time of day has been restored.

If “dIP 2” is set to “Id”, the unit will begin a regeneration immediately for instances 1 and 2. With “dIP 2” set to “del”, the regeneration will not begin until the preset regeneration time.

Note: *If set to immediate mode as timeclock or timeclock backup, the unit will initiate regeneration at 12:00 AM. In the delay mode, “REG” indicator will light at 12:00 AM and regeneration will occur at delayed time.*

Start-Up

- Close the main water supply valve.
- Set the Cul-Flo-Valv® to the bypass position.
- Ensure that all faucets at the installation site are closed.
- Direct the drain line discharge into a bucket where flow can be observed.
- Plug the transformer into a 120 Volt, 60 Hz, single-phase receptacle.
- Wait for the control to energize the motor and home itself.
- Set the timer to the correct time of day.
- Open the main supply valve.
- Initiate an immediate regeneration to move the control into the backwash position.
- Refer to the section on manual cycling for information on cycling the control through its positions.
- When in the backwash position, slowly shift the bypass to the soft water position until water flows.
- Allow the tank to fill slowly until water flows from the drain line.
- When flow to drain is established, open the bypass fully. Watch the drain line discharge for signs of resin. If signs of resin particles appear, reduce the flow. Increase the flow again when resin no longer appears in the discharge.
- When the unit is filled with water, return the timer to the service position and proceed with setting the microprocessor. Refer to the programming section.

Note: *Unplugging the Culligan® Medallist Series water softener will not affect any of the control settings. Once programmed in, the settings will be stored indefinitely. In the event of a power failure the time-of-day setting will be stored for 1-2 days. If longer time storage is necessary, a battery backup is available. Refer to the Service Manual for additional information.*

Before Leaving the Installation Site

Sanitize the water softener. See sanitizing procedure on page 42.

Ensure that the brine tank has water to the level of the float. Add water to the tank with a hose or put the unit into a full recharge so that the brine refill cycle will fill the tank with the proper amount of water.

The water heater will hold hard water for several days. Advise the customer that the existing water volume in the tank will need to be used before the hot water is soft. If soft hot water is required immediately, refer to the water heater owner's manual for the proper method of draining the water heater.

Explain the operation of the softener to the customer. Make sure the customer knows that there will be new sounds associated with the recharging of the unit. Advise the customer to periodically check and replenish the salt supply.

Check the appropriate softener model box in Owner's Guide. Fill in the hardness and number of people, and then sign and date the corresponding performance data sheet. Leave the Owner's Guide with the customer.

Attach the appropriate data plate label located in the Parts Pack onto the back of the control.

Clean up the unit and installation site, removing any soldering, or pipe threading, residues from the equipment and surrounding area with a damp towel.

Use of Bypass Valve

Depending on where the particular installation was made, the outside sill cocks may or may not be served by conditioned water. Ideally, all lines not requiring soft water should be taken off upstream of the softener. This is not always possible, however, due to the difficulty or expense of rearranging the piping.

Bypass the softener if:

1. The outside lines do not bypass the water softener and the water is to be used for lawn sprinkling or other outside uses.
2. Water is not used for several days.
3. You wish to inspect or work on the valve or brine system.
4. A water leak from the valve is evident.

Three-Valve Bypass

To bypass, close the inlet and outlet valves, and open the bypass valve. Reverse the process to get soft water once again. Be sure to close the bypass valve completely to avoid mixing hard water with soft water.

Caution! If the media tank is to remain attached to the control valve, close only the inlet valve, then open the bypass valve. This will prevent pressure from increasing in the media tank due to warming.

Care and Cleaning

Protect the operation and appearance of the water conditioner by following these precautions:

1. Do not place heavy objects on top of the conditioner cover.
2. Use only mild soap and warm water to clean the exterior of the unit. Never use harsh abrasive cleaners or compounds which contain acid or bleach.
3. Protect the conditioner and drain line from freezing temperatures.
4. Reset the time, if required, after any interruption of electrical power to keep the unit on its normal schedule.

Sanitizing Procedure

A water softener in daily use on a potable water supply generally requires no special attention other than keeping the salt tank filled. Occasionally, however, a unit may require sanitization under one of the following conditions:

- At start-up time.
- After standing idle for a week or more.
- On private supplies, the appearance of off-tastes and odors, particularly if musty or “rotten egg” (caused by harmless sulfate-reducing bacteria).

  Note: *If the water supply contains iron, regenerate the softener before sanitizing to remove iron from the resin.*

> **Caution! Hazard From Toxic Fumes!** Chlorine bleach and common iron control chemicals may generate toxic fumes when mixed.
>
> - If using Culligan Sofner-Gard® or other compounds containing sodium hydrosulfate, sodium bisulfate, or any other reducing agent, disconnect the device feeding the chemical(s) and manually regenerate the unit before sanitizing.
> - Do not use this procedure if the softener salt contains iron control additives.

1. Remove the brine tank cover.
2. Pour directly into the brine chamber 1/3 to 1/2 cup of common household bleach (5.25% sodium hypochlorite) for each cubic foot of resin in the tank.

   Note: *Do not use lemon scented bleach or similar bleaches that contain perfumes.*
3. Manually start recharge. Allow the unit to complete the recharge cycle automatically.

If tastes and odors return frequently, even after sanitization, a continuous chlorination system may be needed. Send a water sample to a qualified laboratory for bacterial analysis.

Analyzing the System

Analyzing the problem involves three basic steps:

1. Check the system in all cycle positions.
2. Compare the data to normal operating data.
3. Determine which component may cause the problem (troubleshooting).
4. If steps 1-3 did not reveal the problem, initiate a regeneration cycle and manually cycle the valve to brine draw (#2 position). Allow the unit to complete the brine draw cycle and observe how the system reacts.

Although it may be possible to solve a specific problem simply by changing a component, analyzing the entire system can reveal additional problems which would otherwise require extra service calls. “Parts changing” is not the same as service.

Check the System

The following tools are needed to collect data:

1. Hardness, iron and chlorine test kits
2. Thermometer
3. Pressure gauge, 0-120 psi
4. 5-Gallon bucket and watch
5. Calculator

The customer can provide most data. By collecting data prior to a service call, a “first guess” about the cause of the problem can be made and the need for any special parts can be determined. If the problem is as simple as lack of salt in the brine tank, a service call may not be needed at all. At the end of Appendix A is a recommended system data sheet that will assist the troubleshooting process.

Application Problems

Many service problems are not due to equipment malfunction, but rather to misapplication or environmental conditions.

The Operation & Performance Specifications (page 5 of this manual) provides the limits of water characteristics for the Culligan Medallist Series water softeners. If the water characteristics fall outside these limits, additional water treatment equipment may be required, or the water characteristics should be brought inside the limits. The system flow rates and exchange capacities are also listed.

Table 5 - Salt Dosage/Capacity shows the gallon capabilities for each unit as a function of salt dosage. If the hardness or water usage has increased, a higher salt dosage, more frequent regeneration, or a larger softener may be needed.

> ***Note:*** *The rate at which brine is drawn from the brine tank should not differ by more than 5%. The refill rate should be as close as possible to the rate shown in Appendix A, Table 3 - Flow Rates; high or low pressure installations may require the substitution of a different refill flow control.*

If there are no apparent general problems or environmental problems, refer to pages 44-46.

Recommended Preventative Maintenance Inspection Schedule

The Culligan Medallist Series water softener has been designed to provide a good, consistent service life. Routinely inspecting the system may help avoid potentially costly breakdowns related to circumstances outside of the control of the dealer and/or user.

Table 9

Component	Suggested Inspection Frequency	Reason for Maintenance
Entire System	At Start-up, after infrequent use (idle for one week or more) or every 3 - 6 months if on a private water supply.	On private supplies, the appearance of off-tastes and odors, particularly if musty or “rotten egg” (caused by harmless sulfate-reducing bacteria) may indicate a need for the system to be sanitized. See page 42.
Backwash Flow Controller	Every 12 months or every time service is performed on the system.	Build up of sediment, iron and/or other foreign materials (found in some water supplies but not necessarily all) could negatively affect system performance. Monitor item for normal or unexpected wear.
Brine Eductor Nozzle and Throat	Every 12 months or every time service is performed on the system.	Build up of sediment, iron and/or other foreign materials (found in some water supplies but not necessarily all) could negatively affect system performance. Monitor item for normal or unexpected wear.
Softening Media	Every 2 - 3 years	Chlorinated water supplies can breakdown and destroy resin material. Resin material may also perform poorly if subjected to other materials (sediment, iron, alum, etc.) found in some water supplies (but not necessarily all).

Troubleshooting Guide

Problem	Cause	Solution
1. Unit has blank display.	A. Unit has no power.	A. Verify that unit is connected to a constant power source (Not an outlet on a switch).
	B. Defective plug-in transformer.	B. Replace plug-in transformer.
2. Softener fails to automatically initiate a regeneration.	A. Electrical service to the unit has been disrupted.	A. Verify that unit is connected to a constant power source (Not an outlet on a switch).
	B. Soft-Minder® meter not properly recording total gallons used. The flow meter connection and operation can be verified using the test mode setting on the circuit board.	B. Verify that meter cable is plugged into circuit board. Verify that meter cable is snapped into flow meter housing.
	C. Incorrect programming.	C. Refer to the 'Programming' section and verify all settings.
3. Regeneration occurs at incorrect time.	A. Timer setting incorrect.	A. Reset timer.
	B. Timer flashing.	B. Reset timer and verify that unit is connected to a constant power source.
	C. Circuit board set to immediate regeneration.	C. Set circuit board to delayed regeneration. Refer to 'Programming the option settings'.
	D. Incorrect programming.	D. Refer to the 'Programming' section and verify all settings.
4. Phone Icon is displayed.	A. Jammed seal pack or brine piston.	A. Replace the seal pack or brine piston as outlined in the 'Parts Replacement Guide' section.
	B. Defective cam microswitches	B. Replace cam microswitches
	C. Defective motor.	C. Replace the motor as outlined in the 'Parts Replacement Guide' section.
5. Hard water to service. The root cause of hard water to service may also lead to problems such as Iron or Hardness bleed in softeners.	A. Cul-Flo-Valv® is open or o-rings on Cul-Flo-Valv bypass stem are cut.	A. Close bypass valve or replace o-rings on bypass stem.
	B. Salt or Chemical storage tank is empty.	B. Add salt or chemical to storage tank and verify that proper level of salt or chemical is maintained.
	C. Eductor screen or nozzle plugged.	C. Clean or replace eductor nozzle and/or screen.
	D. Incorrect programming. (Salt dosage too low for influent hardness)	D. Refer to 'Programming' section and verify that settings are correct.
	E. Insufficient water flowing to salt storage tank.	E. Verify that refill settings are correct, and clean the refill flow restrictor.
	F. Internal seal leak.	F. Replace seal pack as outlined in the 'Parts Replacement Guide' section.
	G. Excessive water usage.	G. Verify that programming is correct. For Time Clock units increase regeneration frequency.
	H. Unconditioned water in water heater tank.	H. Flush water heater to fill tank with conditioned water. Note: Follow water heater manufacturer's recommendation.
	I. Salt bridge.	I. Break up salt bridge in brine tank. Do not try to break the salt bridge by pounding on the outside of the brine tank.

Problem	Cause	Solution
6. Loss of water pressure.	A. Inadequate mineral in media tank.	A. See problem 7 & 8.
	B. Control and/or resin bed plugged with debris or iron build-up.	B. Clean control and increase frequency of regenerations or length of backwash. Plant recondition if necessary.
	C. Inlet manifold plugged.	C. Remove control from tank and clean inlet manifold. Check if eductor screen/nozzle is also plugged.
	D. Control plugged with foreign material broken loose from recent plumbing work.	D. Clean control.
7. Loss of mineral to drain.	A. Improper drain line flow control.	A. Ensure that the control has the proper drain line flow control. (See Table 10)
	B. Air in water system.	B. Ensure that system has proper air eliminator control.
8. Mineral to service.	A. Control connected to tank backwards.	A. Verify that control is properly mounted to the tank.
	B. Defective outlet manifold.	B. Replace outlet manifold.
9. Excessive water in salt storage tank.	A. Secondary shut-off (brine valve float) not properly set.	A. Refer to ‘”A” Dimension Charts/Refill Rates’ to set the brine valve float dimension.
	B. Plugged drain line flow control. (Unit will not draw brine).	B. Clean drain line flow control.
	C. Plugged eductor system. (Unit will not draw brine).	C. Clean eductor screen and nozzle.
	D. Slow leak to brine line. Faulty eductor sleeve or piston.	D. Replace eductor sleeve and piston.
	E. Power outage while control was in refill position.	E. Verify that items A-D are not the cause the extra water in the storage tank.
10. Excessive water in salt storage tank (Water above brine valve float).	A. Faulty brine valve; float shut-off failure.	A. Clean brine valve, replace stem seat, or replace brine valve. When the brine valve is faulty, one of the items listed under problem 9 is also required in order to produce excessive water in the storage tank.
11. Unit fails to refill storage tank.	A. Refill restrictor plugged.	A. Clean or replace refill restrictor.
	B. Air in brine line causes float to slam shut (Float rod is rigid).	B. Verify that all tubing connections are properly assembled.

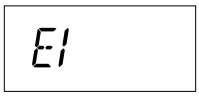
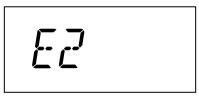
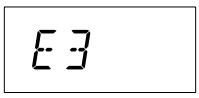
Problem	Cause	Solution
12. Unit fails to draw brine or chemical.	A. Drain line flow control is plugged.	A. Clean drain line flow control.
	B. Plugged eductor system.	B. Clean or replace eductor screen and nozzle.
	C. Line pressure too low.	C. Increase line pressure to a minimum of 20 psi (140 kPa).
	D. Internal control leak.	D. Replace seal pack and/or eductor sleeve/ piston assembly.
	E. Drain line too long or restricted.	E. Verify proper drain line length. See 'Flow Rate and Drain Line Charts'.
	F. Eductor is drawing air into system.	F. Verify that all tubing connections are properly assembled.
13. Unit uses an excessive amount of salt or chemical.	A. Incorrect programming.	A. Refer to the 'Programming' section and verify all settings.
	B. Excessive water in storage tank.	B. Refer to problems 9 & 10.
14. Continuous flow to drain.	A. Internal seal pack leak.	A. Replace seal pack as outlined in the 'Parts Replacement Guide' section.
	B. Seal pack or brine piston jammed in position.	B. Replace the seal pack or brine piston as outlined in the 'Parts Replacement Guide' section.
	C. Power failure while unit was in regeneration.	C. Restore power to unit. Verify that unit is connected to a constant power source.
15. Salt water to service	A. Inadequate Brine/Rinse setting for desired salt dosage.	A. Refer to the 'Programming' section and verify all settings.
	B. Low water pressure lengthens brine draw time.	B. Increase line pressure to a minimum of 20 psi (140 kPa).
	C. Too much brine in the storage tank.	C. Refer to problems 9 & 10.

Error Mode

When a failure is detected, the control will generate and display an error or alarm code, depending on the type of failure, as shown in the table below.

In order to clear an error code (after correcting the problem), push and hold the “Status” key for 10 seconds. After the 10 seconds, the control will clear the error code and cycle the valve to service (Home). Other methods of clearing the error code are: powering down the control for 60 seconds, toggling a DIP switch or changing an input connection (adding or removing a Flow Meter). If the problem is still present after clearing the error code, the error code will again be displayed. While in error mode, the control will not function. When returning from Error mode, the control shall use the values stored in EEPROM unless a DIP switch was toggled or an input connection (Flow Meter) was changed. In those cases, the programmed values shall revert back to the defaults.

For E2 and E3 errors, the control is to attempt to return to home and stop. If the control is successful in finding and stopping in the home position it is to display the error code but return to functioning as normal. If the next regeneration is successful without errors the error code is to be removed and the control will function as normal.

Display	Error Description	Mode of Detection	Clearing Error / Alarm
	Motor Failure to Start (No switch changes)	If the valve fails to reach the desired state within 70 seconds of driving the motor. The control will attempt to start the motor 3 times for 70 seconds each time with a 60 second off period between each attempt.	Press and hold ‘STATUS’ key for 10 seconds
	Motor Failure to Stop (unexpected switch changes)	If the control detects changes in the Cam inputs when the motor is not supposed to be turning	Press and hold ’STATUS’ key for 10 seconds
	Incorrect Cycle Position (switch changes out of sequences)	The control expects to be in a different position than that indicated by the Cam switch closures	Press and hold ‘STATUS’ key for 10 seconds

Circuit Board Troubleshooting

Most circuit board problems are caused by outside influences and it is not the board itself. Replacing the board may seem to work only because the cause hasn’t reappeared – yet.

Let’s start with what to check when you come upon a circuit board problem:

1. **Are those switches aligned too closely to the cam?**
   There should be a small but obvious gap between the switches and the cam so that a “wobbling cam” doesn’t accidentally bump the switch.

2. **Has the seal pack been checked for free movement?**
   Feedback and experience has demonstrated that seal packs that are over-tightened create drag on the motor and delays that would result in an error code: If the motor never stops (still runs after the desired position is sensed, causing unexpected switch closures) OR if the motor gets stuck “timing out” and the control never sees any switch action.

3. **Are all the wiring terminals tightly connected?**
   Sometimes a loose or poorly connected wire can give feedback to the board that would result in an error code or default.

4. **After checking all of these possibilities you should run the diagnostics (test mode) on the board**
   Instructions are listed on page 48.

Listed below are some other circuit board problems and their explanations:

– **Board skips the service position or only stops for a second in service before advancing to the backwash position**
Board has been armed for regeneration. Let the board time out of all three cycles or reset and reprogram the board. Resetting the board can be done by connecting or disconnecting the meter cable.

– **Motor goes round and round**
Only one of two things can happen when this is the case; it can find its desired position or it gives you an error code. So, LET IT RUN until you find out which will occur.

  - If the motor still runs or there is power to motor after the error code is displayed, then the triac is likely bad – change the board.
  - If the error code is displayed and the motor is stopped (no power to the motor), check switches, cam and wire harness – the board got a signal it wasn't supposed to or a connection failed.

A word about triacs –

A triac is an electronic switch and can "latch on" when it becomes overheated from a laboring motor (tight seal pack). It may operate properly when it cools down. A continuously running motor could be caused by an overheated triac. Checking the seal pack and voltage draw and allowing the triac to cool down could give you favorable result and prevent the need to change the board. Otherwise, when it is sent to Returned Goods it could test good and be returned.

You clear an error code and it starts into regeneration

It was either in regeneration or has kept track of time since the error code occurred and it's trying to finish the regeneration. Reset and reprogram the board.

The board repeatedly defaults, resets or gains time

Look at the power supply or source. Most of these issues are caused by the power source, so-called "dirty power" having noise interference or incorrect voltage. This could be erratic fluctuations caused by other heavy power draws, poor wiring, low voltage wiring running along high voltage, having active electrical storms that causes "corruption" of the EEPROM. Consider the use of a surge protector or an uninterruptible power supply after you see this repeatedly.

If you suspect the power source is causing problems, take a voltage reading at the outlet, at the power connection on the board, and on the motor leads while the motor is running. We are looking for a consistent range of 108-132 volts at the receptacle and 22-28 volts on the board. Also, the wall transformer is only used to step down the voltage; it is not used for protection or filtering the power source.

Test Mode

In this mode the control can be put through a performance test to verify the operation of the board components. Moving dip #1 from service to test mode enters the test mode; the motor output should turn off (if it was on) upon entering test mode.

When entering test mode all program settings and statistical data should be stored in EEPROM. The test sequence is to follow the description as found in the table below. Upon exiting test mode, if a device connection is different (flow meter connected or disconnected) or a DIP switch setting is changed from the condition that was present when entering test mode, the control should behave as if the change was made while out of test mode. For example, if a flow meter was added and not removed while in test mode, the control shall load the flow meter defaults when exiting test mode.

Test Description	Display Information	Action Trigger
Start Test Mode	All LCD segments lit	DIP switch #1 set to on, all others off
Software version	Software version #	Press a key after entering test mode as above
Enter test mode	Blank Display	Press a key after displaying the software version #.
DIP switch #2	Display to show “2”	Turn on DIP switch #2
	Display to Blank	Turn off DIP switch #2
DIP switch #3	Display to show “3”	Turn on DIP switch #3
	Display to Blank	Turn off DIP switch #3
DIP switch #4	Display to show “4”	Turn on DIP switch #4
	Display to Blank	Turn off DIP switch #4
DIP switch #5	Display to show “5”	Turn on DIP switch #5
	Display to Blank	Turn off DIP switch #5
DIP switch #6	Display to show “6”	Turn on DIP switch #6
	Display to Blank	Turn off DIP switch #6
DIP switch #7	Display to show “7”	Turn on DIP switch #7
	Display to Blank	Turn off DIP switch #7
DIP switch #8	Display to show “8”	Turn on DIP switch #8
	Display to Blank	Turn off DIP switch #8
Status Key	Display to show “11”	Press Status Key
+ Key	Display to show “12” and motor to run for 15 seconds	Press + Key
- Key	Display to show “13” (and turns on Chlorinator output for 15 seconds IF chlorinator is connected)	Press - Key
Regen Key	Display to show “14”	Press Regen Key
Home Switch	Display to show “H” when Home switch closed	Close Home Switch
	Display to Blank when open	Open Home Switch
Position Switch	Display to show “P” when Position switch closed	Close Position Switch
	Display to Blank when open	Open Position Switch
Flow Meter	Display to show “Phone” icon when flow meter is connected	Connect Flow Meter
	Display to blink “Phone” icon when flow meter is sending pulses	Spin Flow Meter
Chlorinator	Display to show “Colon” icon when chlorinator is connected	Connect Chlorinator
	Display to blink “Colon” icon when chlorinator is turned on	Turn on Chlorinator when the plus key is pressed.

When exiting test mode, if the dip switches or sensors have not changed, the control is to restore all values from EEPROM, and resume where it left off after homing. If the dip switch or sensors have change, the values should reset to factory defaults. In either case the valve should home itself upon exit of test mode.

Service

Familiarize yourself with the replacement procedures and component parts thoroughly before attempting any repair.

Warning! Disconnect all electrical power to the unit before servicing. Bypass the unit and relieve system pressure before attempting to repair.

Circuit Board

To replace the AccuSoft™ circuit board, refer to figure 23 and the parts list and proceed as follows:

1. Lift up the front cover of the control.
2. Remove all connected wire leads from the board.

   Caution! Grip all connections to the circuit board by the connecting terminals for assembly and disassembly. Failure to do so could result in damage to the wire leads or connecting terminals.

3. Remove the circuit board from the retaining clips on the front cover.

   Caution! Do not touch any surfaces of the circuit board. Electrical static discharges may cause damage to the board. Handle the AccuSoft circuit board by holding only the edges of the circuit board. Keep replacement boards in their special anti-static bags until ready for use. Mishandling of the circuit board will void the warranty.

4. The new circuit board can be installed by reversing the steps 1-3 above.

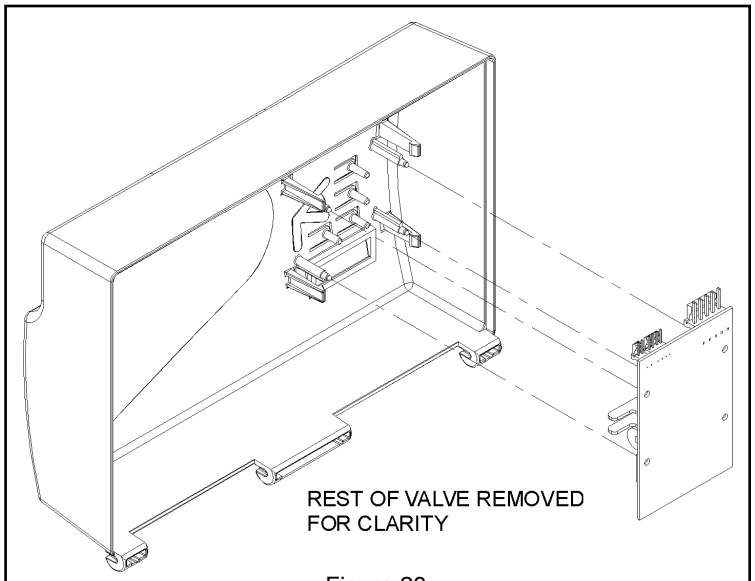


Figure 23

Caution! The wire connectors must be connected to the circuit board properly. The wires must exit the plug-in connector opposite of the raised white base of the circuit board connector.

Refer to Figure 24 for assembly and disassembly of the various valve components.

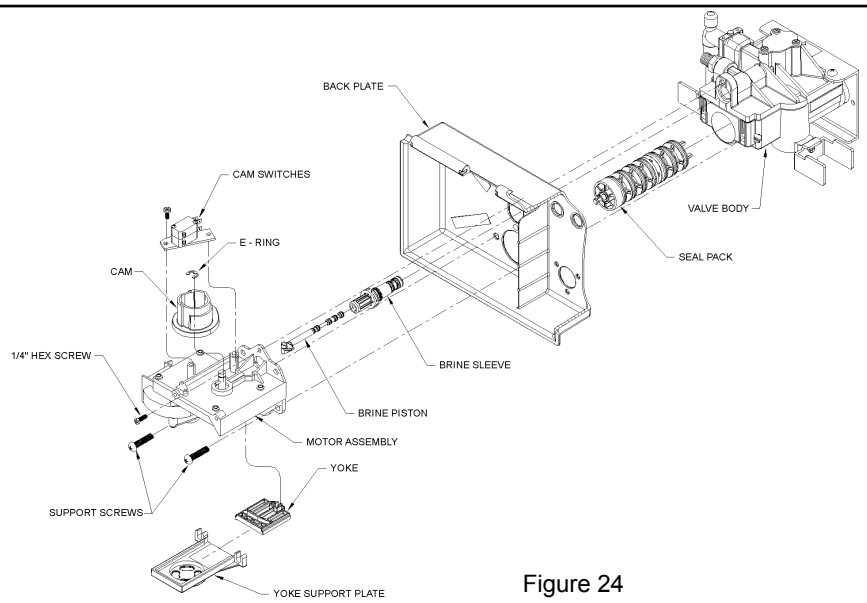


Figure 24

Drive Motor Assembly

1. Remove the drive motor cam switches by removing the one screw holding the switches to the motor.
2. Remove the E-ring holding the drive motor cam to the camshaft with a flat tip screwdriver.
3. Lift the cam off the shaft.
4. Remove the screw above the eductor piston assembly.
5. Loosen the two screws holding the yoke support plate and the motor to the control valve.
6. Remove the yoke support plate and yoke by gently pulling them down.
7. Fully remove the two screws holding the motor to the control. The motor will pull away from the control and the backplate will hang on the valve body.

Note: *If the unit is equipped with a meter, it is recommended to unclip the meter cable from the meter body to allow backplate movement.*

Note: *Care should be taken to not damage the brine piston if it is not going to be replaced. The brine piston will need to be twisted slightly in order to remove it from the motor die casting.*

This procedure can be followed in the reverse order to reassemble the motor to the control. When reassembling the scotch yoke, the yoke must slide into the yoke support plate prior to pushing the assembly up into the piston end and follower. Figure 25 shows proper assembly of the yoke into the support plate.

Note: *The seal pack may need to be repositioned in order for the follower to be inserted into the yoke, using the motor and backplate to push the seal pack fully into the valve is helpful in aligning the yoke. Make sure that the follower is in the follower slot on the yoke, and that the end of the piston rod is held in the end of the yoke.*

Note: *When attaching the yoke support plate be certain to push up on the plate until the two mounting screws bottom in the U-shaped channels of the support plate.*

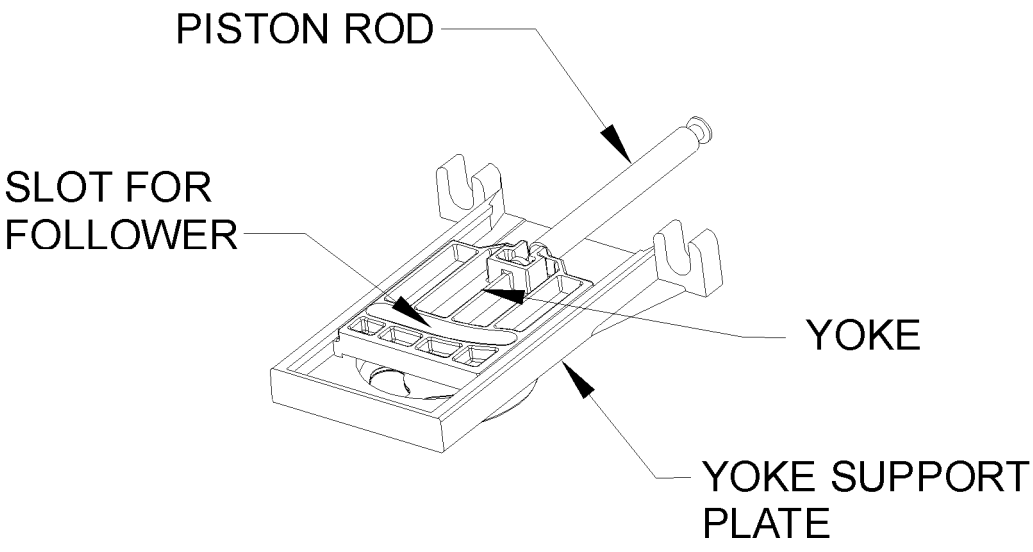


Figure 25

Seal Pak Assembly

Follow the instructions for replacing the drive motor assembly through step 7, then continue as follows:

1. With the drive motor and backplate set aside, firmly pull the seal pack assembly from the valve body.
2. Lightly lubricate the o-rings of the replacement seal pack with silicone grease.
3. Reverse the procedure for reassembly.

Note: *Use only silicone grease; petroleum-based lubricants will cause the degradation of the rubber components.*

Caution! Do not twist the seal pack upon insertion. This can cause the outer o-rings to pinch, cut, or crimp.

Eductor Piston / Eductor Sleeve Assembly

Follow the instructions for replacing the drive motor assembly through step 7, then proceed as follows:

1. With the drive motor set aside, firmly pull the eductor piston & sleeve assembly from the valve body.
2. Lightly lubricate the o-rings of the replacement piston & sleeve assembly with silicone grease.
3. Reverse the procedure for reassembly.

Note: *Use only silicone grease; petroleum-based lubricants will cause the degradation of the rubber components.*

Note: *The eductor piston and sleeve assemblies are unique to the softener, filter, and Super S® controls. Refer to the parts list to ensure that the proper assembly is used.*

Eductor Assembly

Refer to figure 13, page 20 and the following instructions for replacement of the eductor.

1. Remove the three screws and the eductor plate.
2. Remove the eductor screen by lifting it from the eductor body.
3. Remove the eductor body by grasping one of the projections with the pliers and gently pulling upward.
4. Reverse the procedure to reassemble. Be certain that the replacement eductor body contains the correct eductor nozzle.

Table 9 - Eductor Selection

Model	Nozzle Color	Nozzle with O-Ring P/N
8” Medallist	Blue	P1013894
30 & 45 Medallist	Beige	P1013895
60 Medallist	Beige	P1013895

Backwash Flow Control

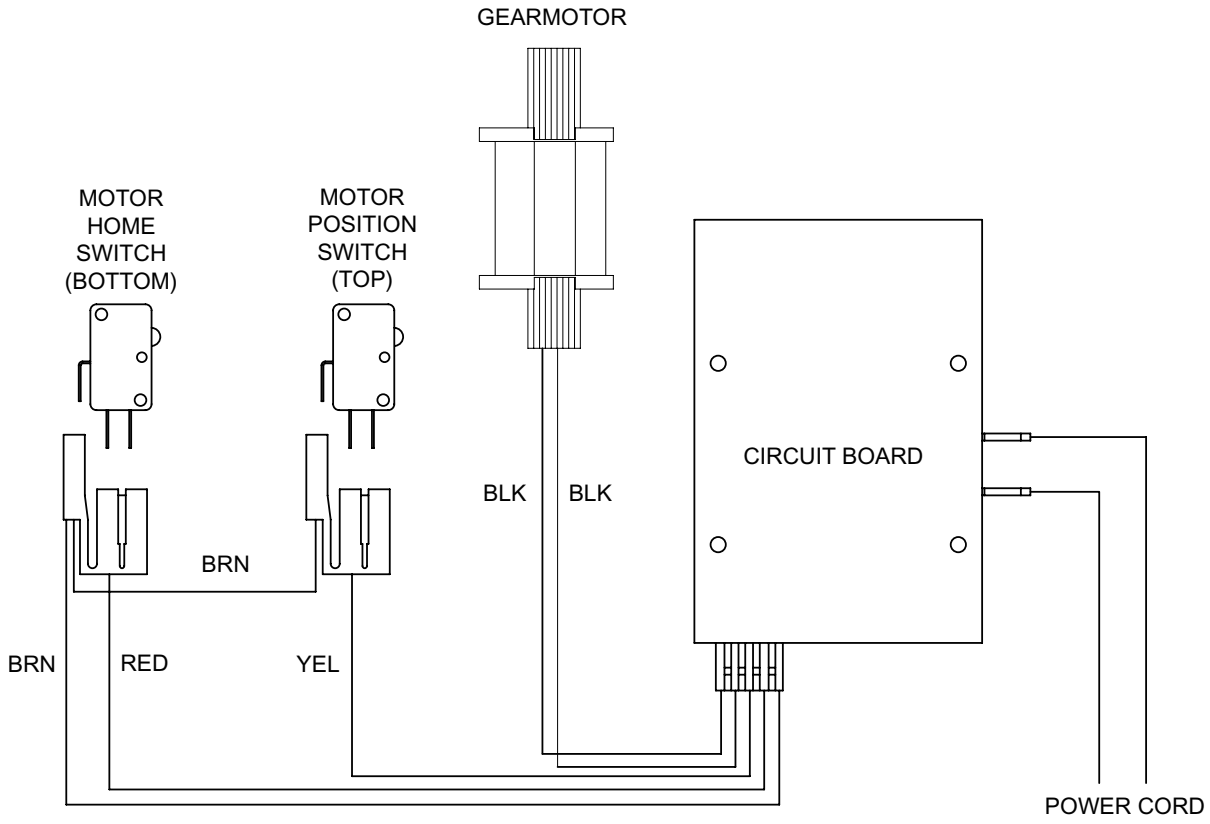
Refer to figure 13, page 20 and the following instructions for replacement of the backwash flow control:

1. Remove the drain elbow retaining clip from the valve body.
2. Pull the drain elbow from the valve body.
3. Remove the flow control from the valve body and replace with a new flow restrictor.
   Note: *The number on the backwash flow control should face into the valve body.*
4. Reverse the procedure to reassemble. Be certain that the replacement is the correctly sized flow restrictor.

Table 10 - Backwash Flow Restrictor Selection

Model	Color & Number	P/N
8” Medallist	Black, #1	P0331634
30 & 45 Medallist	Brown, #2	P0331635
60 Medallist	Green, #3	P0331636

Wiring Diagram



Appendix A

Table 1 - Maximum Allowable Drain Length

Operating Pressure	0 ft (0 m)	2 ft (0.6 m)	4 ft (1.2 m)	6 ft (1.8 m)	8 ft (2.4 m)	10 ft (3 m)
30 psi (210 kPa)	60 ft (18 m)	50 ft (15 m)	30 ft (9 m)	15 ft (5 m)	Not allowable	Not allowable
40 psi (279 kPa)	100 ft (30 m)	90 ft (27 m)	70 ft (21 m)	50 ft (15 m)	30 ft (9 m)	12 ft (4 m)
50 psi (349 kPa)	145 ft (41 m)	115 ft (35 m)	80 ft (24 m)	80 ft (24 m)	60 ft (18 m)	40 ft (12 m)
60 psi (419 kPa)	Normal Installation should not require more than 100 ft (30 m) of drain line		100 ft (30 m)	100 ft (30 m)	85 ft (26 m)	60 ft (18 m)
80 psi (559 kPa)				140 ft (43 m)	120 ft (37 m)	
100 psi (669 kPa)				150 ft (46 m)		

Table 2 - Media Volumes and Freeboard

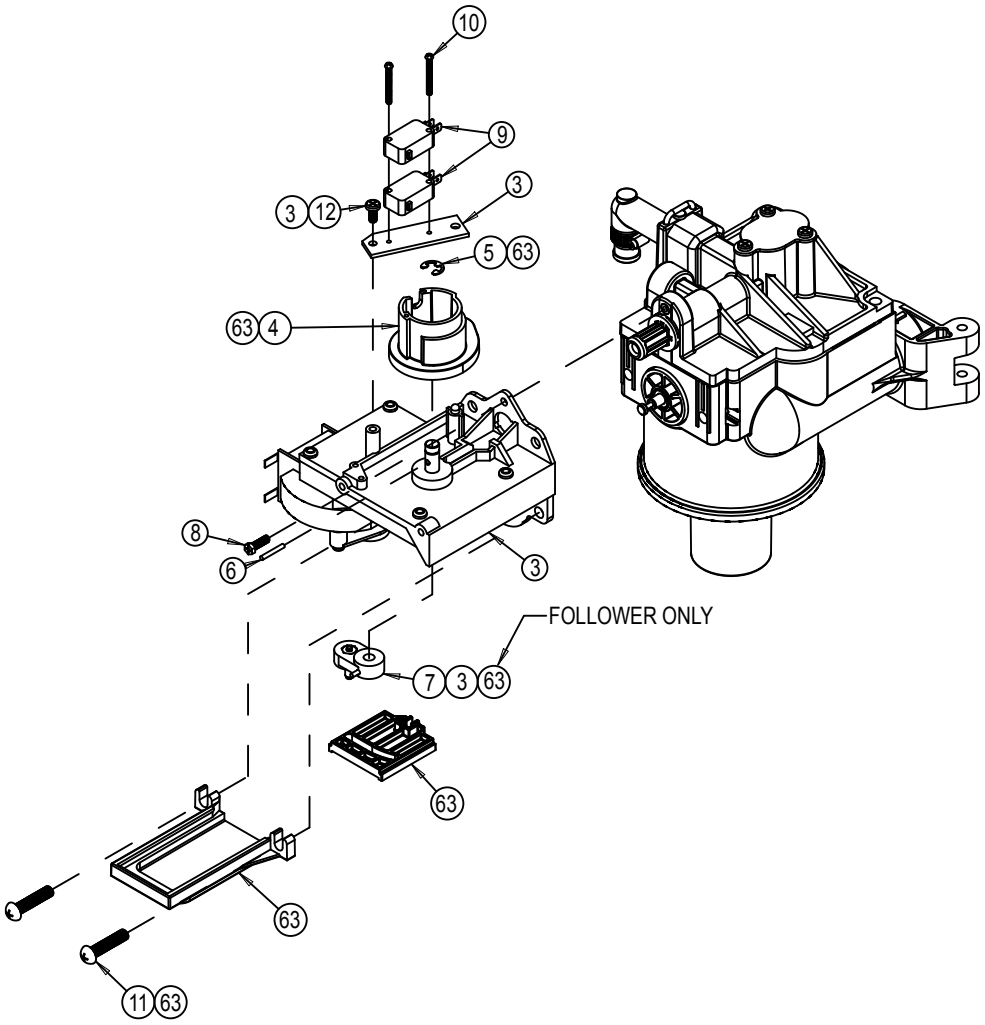
Model	Cullex (ft^3)	Cullsan (lbs)	Freeboard (in)
8” Model	0.7	6	20.5 - 21.5
Model 30	1.0	15	13
Model 45	1.5	15	15
Model 60	2.0	16	16

Table 3 - Flow Rates

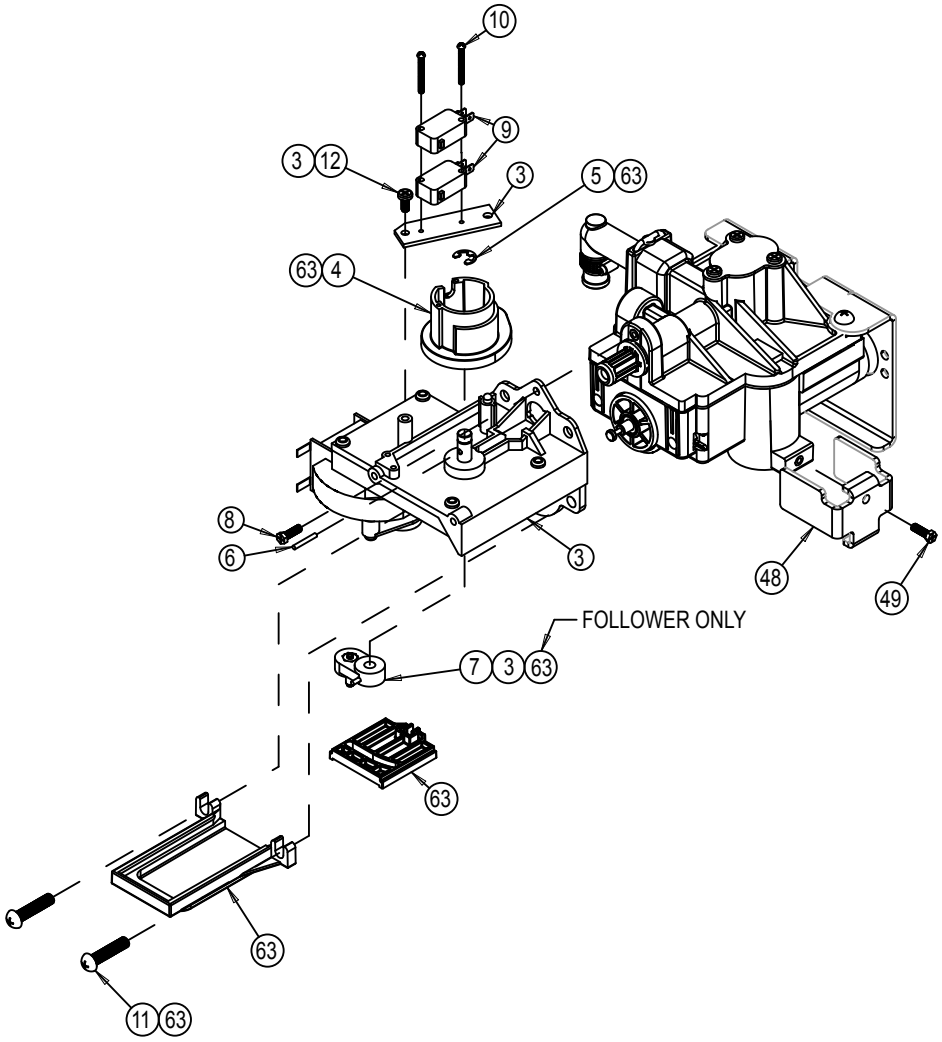
Model	Service	Backwash/Fast Rinse	Brine Draw	Slow Rinse	Refill
8” Model	5.9 gpm @ 12 psi	1.1 - 1.6 gpm	0.44 gpm	0.27 gpm	0.45 gpm
Model 30	9.0 gpm @ 12 psi	1.6 - 2.2 gpm	0.44 gpm	0.27 gpm	0.45 gpm
Model 45	9.6 gpm @ 15 psi	1.6 - 2.2 gpm	0.44 gpm	0.27 gpm	0.45 gpm
Model 60	10.0 gpm @ 15 psi	2.6 - 4.0 gpm	0.93 gpm	0.27 gpm	0.80 gpm

Parts List

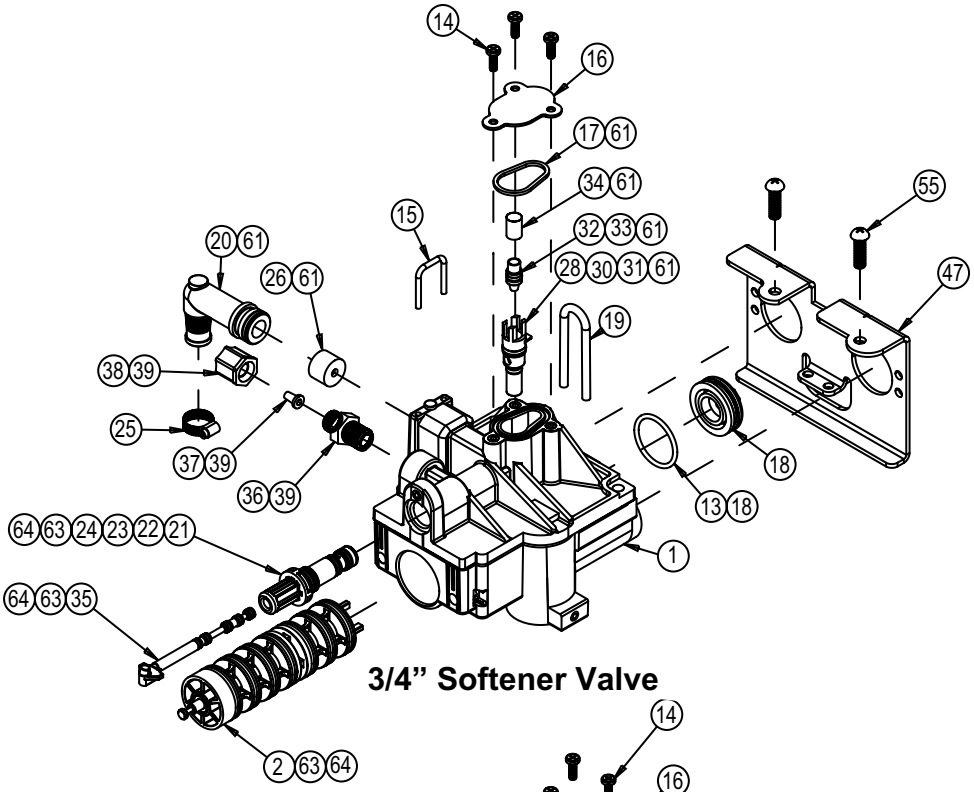
3/4” Medallist Control



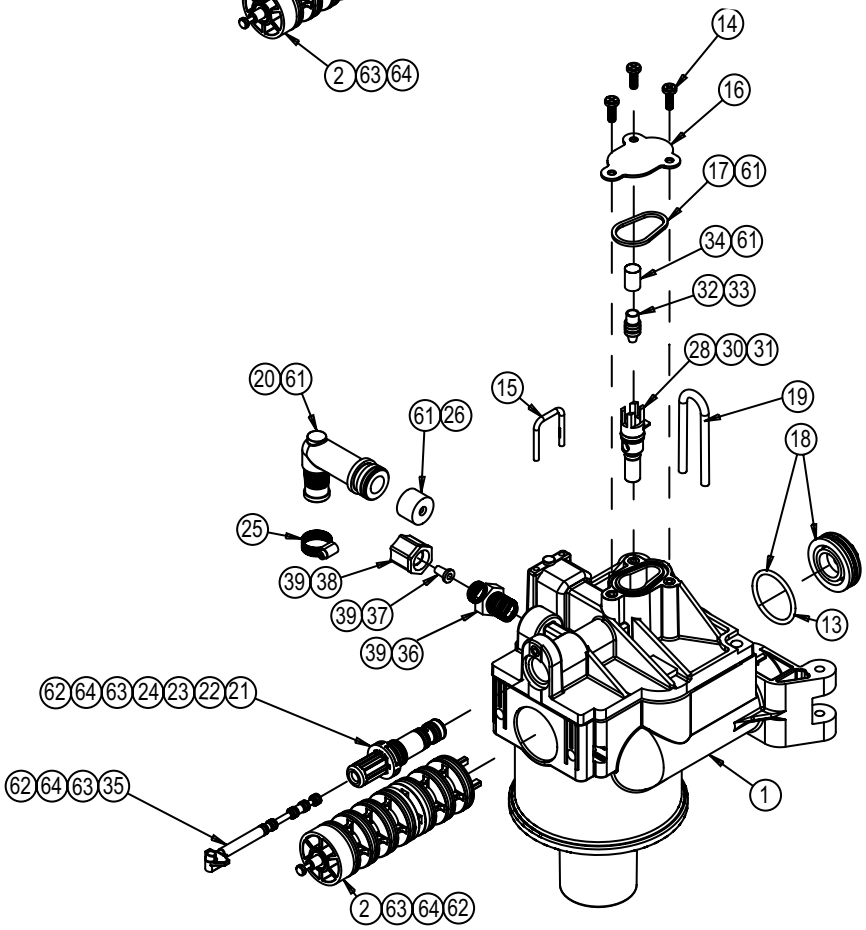
1” Softener Valve



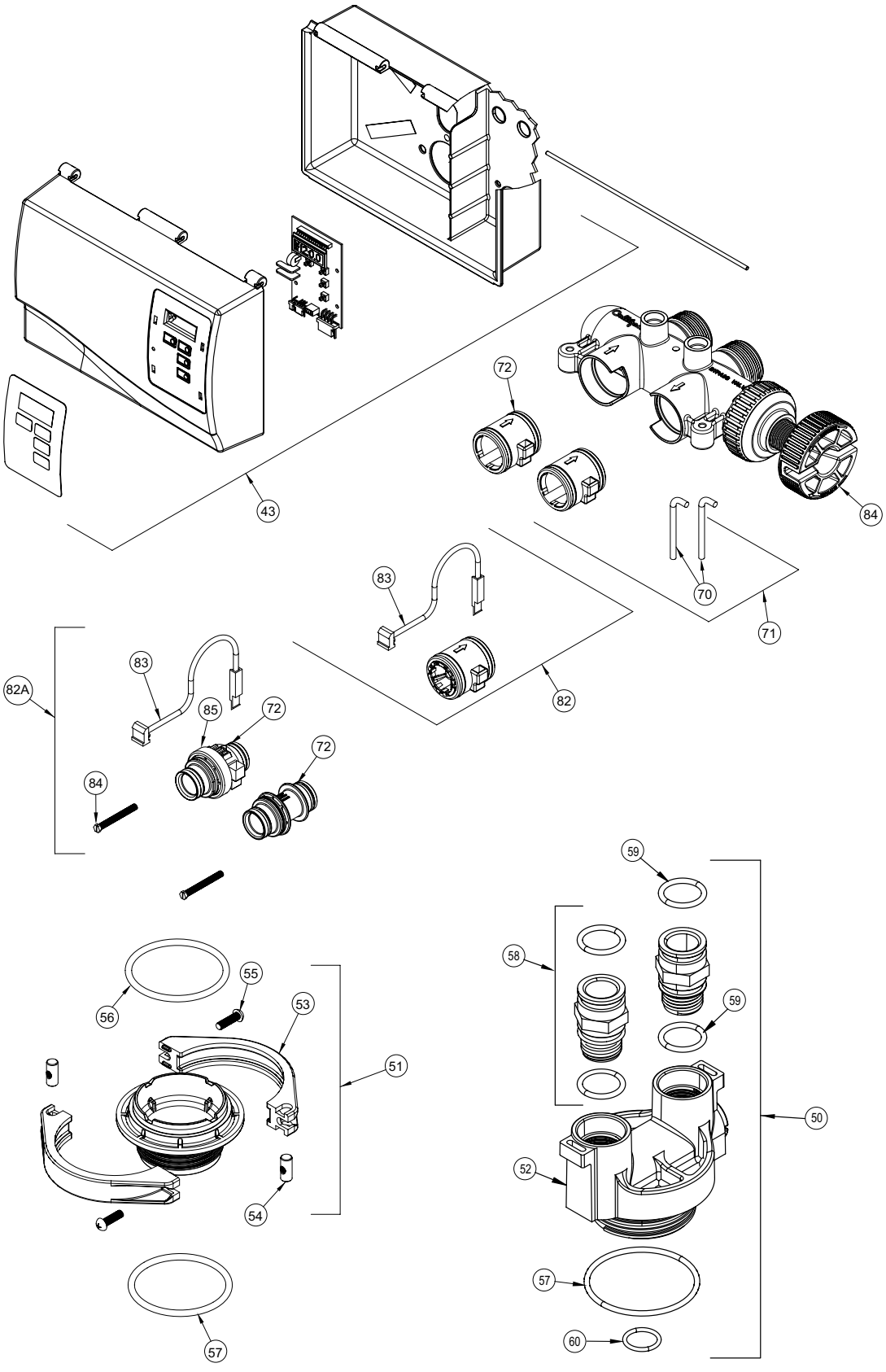
3/4” Softener Valve



3/4” Softener Valve



1” Softener Valve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Power Valve Service Parts List

Item #	Part #	DESCRIPTION	Quantity/Pack	Valve Size	
				3/4" Valve	1" Valve
1A	01013976	Control Valve Body 1"	1 Each		X
1B	00449865	Control Valve Body 3/4"	1 Each	X	
2	01013083	Seal Pack Assembly	1 Each	X	X
3A	01014179	Drive Motor Kit 24V	1 Each	X	X
4	P1013031	Drive Cam	10 Each/Pack	X	X
5	P1013043	Retaining E-ring	10 Each/Pack	X	X
6	00445246	Pin	1 Each	X	X
7	P1013677	Bell Crank/Follower Kit	10 Each/Pack	X	X
8	P1001784	Screw, motor retaining, top	25 Each/Pack	X	X
9A	P1003244	Microswitch 24v	10 Each/Pack	X	X
10	P0448686	Screw, Microswitch retaining	25 Each/Pack	X	X
11	P0318452	Screw, Motor retaining, bottom	25 Each/Pack	X	X
12	P0318455	Screw, Microswitch Plate	25 Each/Pack	X	X
13	P0444914	O-ring, Rear Seal	10 Each/Pack	X	X
14	P0448687	Screw, Eductor Cover	25 Each/Pack	X	X
15	P0447387	Clip, Drain Elbow	25 Each/Pack	X	X
16	P0401022	Eductor Cover	10 Each/Pack	X	X
17	P0445797	Seal, Eductor Port	10 Each/Pack	X	X
18	00448126	Plug, Body, Rear	1 Each	X	X
19	00448128	Clip, Body, Rear	1 Each	X	X
20	01017758	Drain Elbow Assembly	1 Each	X	X
21A	P0448853	Repl Eductor Sleeve (Softener)	10 Each/Pack	X	X
22A	P0447986	O-ring, Eductor Sleeve, Small	25 Each/Pack	X	X
23A	P0308407	O-ring, Eductor Sleeve, Large	25 Each/Pack	X	X
24	P0448750	Screen, Eductor Sleeve	10 Each/Pack	X	X
25	P0451701	Hose Clamp, Drain	25 Each/Pack	X	X
26A	P0331634	FC Washer, 1.2 GPM Black	10 Each/Pack	X	X
26B	P0331635	FC Washer, 2.0 GPM Brown	10 Each/Pack	X	X
26C	P0331636	FC Washer, 3.5 GPM Green	10 Each/Pack	X	X
28A	P0401248	Eductor Throat, Brown (9"10"12")w/O-rings	10 Each/Pack	X	X
30A	P0308437	O-Ring, Eductor Throat/Plug, Large	25 Each/Pack	X	X
31A	P0308438	O-Ring, Eductor Throat, Small	10 Each/Pack	X	X
32A	P1013894	Eductor Nozzle, Blue (9",10") w/ O-ring	10 Each/Pack	X	X
32B	P1013895	Eductor Nozzle, Beige (10", 12") w/ O-ring	10 Each/Pack	X	X
33A	P0308438	O-ring, Eductor Nozzle	10 Each/Pack	X	X
34	P0445269	Eductor Screen	10 Each/Pack	X	X
35A	P0447987	O-ring, brine piston	10 Each/Pack	X	X
36B	P1018776	Connector, Brine Line, 3/8"	25 Each/Pack	X	X
	00447915	Connector, Brine Line, 1/2"	1 Each		X
37B	P1018871	Insert, Brine Line Connector, 3/8"	25 Each/Pack	X	X

Item #	Part #	DESCRIPTION	Quantity/Pack	Valve Size	
				3/4” Valve	1” Valve
	00440516	Insert, Brine Line Connector, 1/2”	1 Each		X
38B	P1002205	Nut, Brine Line Connector, 3/8”	25 Each/Pack	X	X
39	00440402	Nut, Brine Line Connector, 1/2”	1 Each		X
40B	01020368	Circuit Board Kit - Medallist	1 Each	X	X
43B	01019708	Enclosure Kit - Medallist	1 Each	X	X
44A	P1014734	Wire Harness - CB Gold/Medallist	5 Each/Pack	X	X
45B	P1014787	Power Cord - Medallist	5 Each/Pack	X	X
46	P1000372	Cord Grip (Power Cord)	25 Each/Pack	X	X
47	01004689	Bracket - 3/4” Medallist Rear	1 Each	X	
48	01005130	U-clamp - 3/4” Medallist	1 Each	X	
49	P0448687	Screw, U-clamp, 3/4” Medallist	25 Each/Pack	X	
50A	01013971	Tank Adapter Kit, ACME, Medallist	1 Each	X	
50B	01013970	Tank Adapter Kit, NPSM, Medallist	1 Each	X	
51	01014153	Adapter Assy, 1” valve to tank w/o O-ring	1 Each		X
52A	01013958	Tank Adapter, 1” Valve	1 Each		X
52B	00444808	Tank Adapter, 3/4” Valve, ACME threads	1 Each	X	
52C	00403523	Tank Adapter, 3/4” Valve, NPSM threads	1 Each	X	
53	P1013959	Tank Clamp, 1” Valve	10 Each/Pack		X
54	P1013669	Tank Clamp Pin, 1” Valve	10 Each/Pack		X
55	P0318383	Tank Clamp Screw, 1” Valve/3/4” bkt	10 Each/Pack		X
56	P1014848	O-ring, Large, 1” Valve to Tank Adapter	25 Each/Pack		X
57A	P0440052	O-ring, 3/4”/1” Valve Adapter to ACME Tank	25 Each/Pack	X	X
57B	P0308447	O-ring, 3/4” Valve Adapter to NPSM Tank	10 Each/Pack	X	
59	P0333957	O-ring, 3/4” Couplings to Tank	25 Each/Pack	X	
60	P0308427	O-ring, Manifold, 3/4” Valve	50 Each/Pack	X	
61	01016266	Eductor Rebuild Kit (Softeners)	1 Each	X	X
62	01016267	Rebuild Kit - Brine Piston/Seal Pack	1 Each	X	X
63	01016269	Seal Pack/Bell Crank Kit	1 Each	X	X
64	01013033	Seal Pack/Brine/Cam (Softeners)	1 Each	X	X
67A	01018425	Bypass Valve - 1” Rotary	1 Each	X	
67C	01018760	Bypass Valve - 1”/1-1/4” Rotary	1 Each		X
67E	01018248	1” Straight Through Adapter	1 Each		X
67F	01018249	1 1/4” Straight Through Adapter	1 Each		X
68B	01018755	Rebuild Kit - 1”/1-1/4” Rotary Bypass	1 Each		X
70	P1009075	Retaining Clip, 1” Bypass valve	10 Each/Pack		X
71A	01013985	Coupling Kit - 3/4” Bypass	1 Kit	X	
71B	01014033	Coupling Kit - 1” Bypass	1 Kit		X
72A	P0308427	O-ring, 3/4” Couplings/Meters	50 Each/Pack	X	
72B	P1009099	O-ring, 1” Couplings/Meters	50 Each/Pack		X
74	P0318546	Screw, 3/4” Couplings	25 Each/Pack	X	

Item #	Part #	DESCRIPTION	Quantity/Pack	Valve Size	
				3/4” Valve	1” Valve
75A	01010783	1” Copper Adapter Kit, (1” Bypass)	1 Each		X
75B	01016564	3/4” Copper Adapter Kit (1” Bypass)	1 Each		X
75C	P1019783	3/4” Elbow Copper Adabpter Kit	10 Pairs/Pack	X	
76A	01016565	3/4” Elbow Copper Adapter Kit (1” Bypass)	1 Each		X
76B	P1019782	3/4” Copper Adapter Kit	10 Pairs/Pack	X	
77	01018757	1” NPT Female Elbow Kit (1” Rotary Bypass)	5 Pair/Pack		X
78	01018758	1” NPT Kit (1” Rotary Bypass)	5 Pair/Pack		X
79	P1009856	Gasket, Copper Plumbing Adapters	25 Each/Pack		X
81A	01018248	Plumbing Adapter Kit - 1” NPT	1 Each		X
81B	01018249	Plumbing Adapter Kit - 1-1/4” NPT	1 Each		X
82A	01012905	Meter Kit - 3/4” w/wire harnes	1 Each	X	
82B	01011188	Meter Kit - 1” w/wire harness	1 Each		X
83	01008070	Wire Harness, 3/4”/1” Meters	1 Each	X	X
84	P1012820	Screw, 3/4” meter kit	25 Each/Pack	X	
86	01018133	Transformer, Dual Output	1 Each	X	X
87	01015972	Transformer, Outdoor Models, 120/24	1 Each	X	X
89	01013839	Backup Battery, Gold	1 Each	X	X

Service Parts Kits

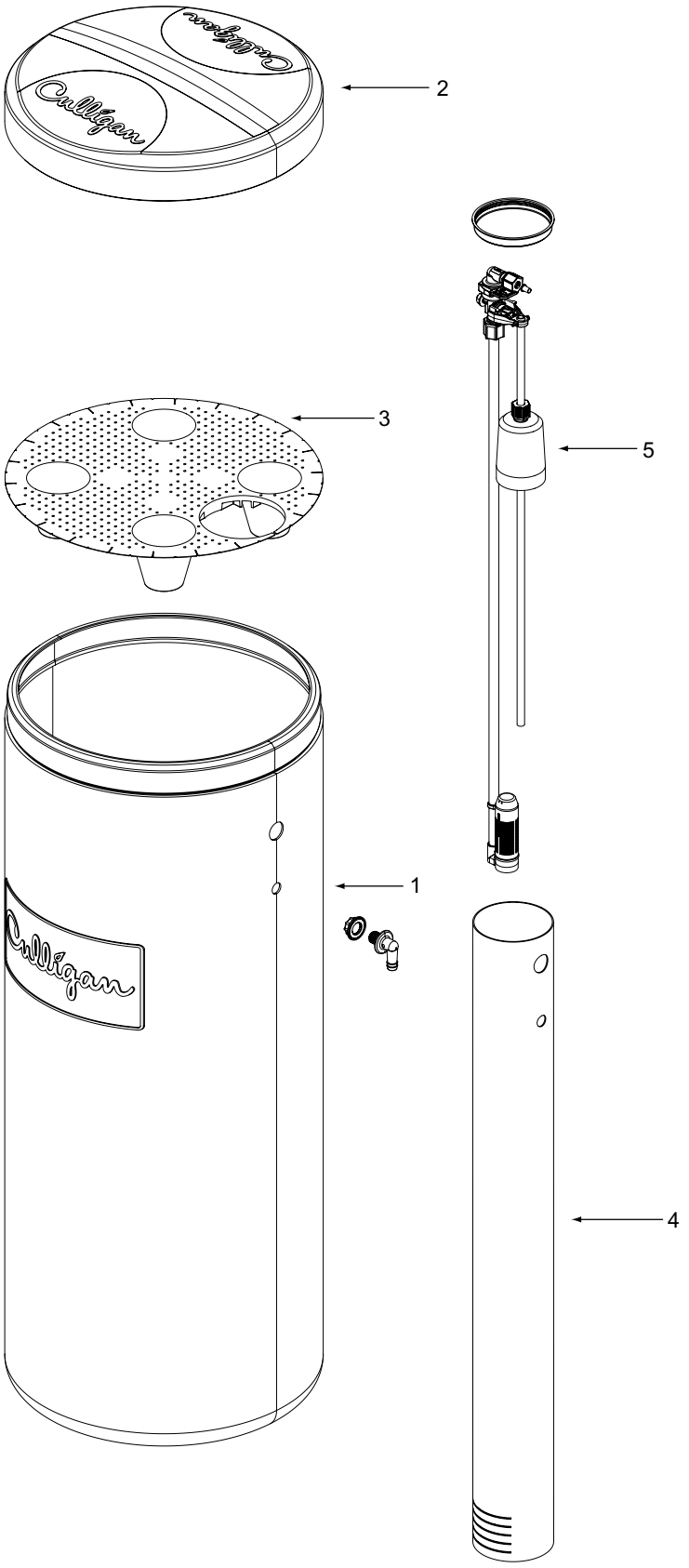
Part No.	Description
01-0162-67	Power Valve Seal Rebuild Kit (#62)
	Seal Pack
	Eductor Sleeve w/ O-Rings
	Brine Piston w/ O-Rings
01-0162-66	PV Eductor Rebuild Kit (#61)
	Light Brown Eductor w/ O-Ring
	Blue Restrictor w/ O-Ring
	Beige Restrictor w/ O-Ring
	Eductor Screen
	Eductor Port Gasket
	Black Flow Control (1.2 gpm)
	Brown Flow Control (2.0 gpm)
	Green Flow Control (3.5 gpm)
	Drain Elbow Assembly w/ O-Ring
01-0162-69	Power Valve Drive & Seal Rebuild Kit (#63)
	Seal Pack
	Eductor Sleeve w/ O-Rings
	Brine Piston w/ O-Rings
	Scotch Yoke Bracket
	Scotch Yoke
	Bell Crank & Follower Assembly
	Screw (2 each)
	E-Ring
	Cam
01-0141-79	Drive Motor Kit (#3)
	Motor
	Bell Crank
	Nut
	Follower
	Roll Pin
	Roll Pin
	Switch Bracket
	Screw (2 each)

Conditioner Tank

Part No.	Description
00440821	Tank Assembly, 8”, Complete
01016389	Tank Assembly, 10” x 40”, Complete
01016390	Tank Assembly, 10” x 54”, Complete
00441897	Replacement Tank, 8”, Empty
01014891	Replacement Tank, 10” x 40”, Empty
01014572	Replacement Tank, 10” x 54”, Empty
01014573	Replacement Tank, 12” x 52”, Empty
01000819	Outlet manifold, 8”
01014482	Outlet manifold, 10” x 40”
01014540	Outlet manifold, 10” x 54”
01014570	Outlet manifold, 12” x 52”
P0308427	O-ring (outlet manifold for 3/4” control)
P1009099	O-ring (outlet manifold for 1” control)
01009847	Top Strainer, Fine Slot, Medallist Plus Softeners
01011195	Top Strainer, Wide Slot, Medallist Plus Softeners
01014508	Top Strainer, Fine Slot, Medallist 8” Softeners
01014507	Top Strainer, Wide Slot, Medallist 8” Softeners
01018390	8” Tank Jacket
01018391	10” x 40” Tank Jacket
01018392	10” x 54” Tank Jacket
01017725	8” Tank Base
01017724	10” Tank Base
01017752	Screw for Tank Base (2 required per tank)

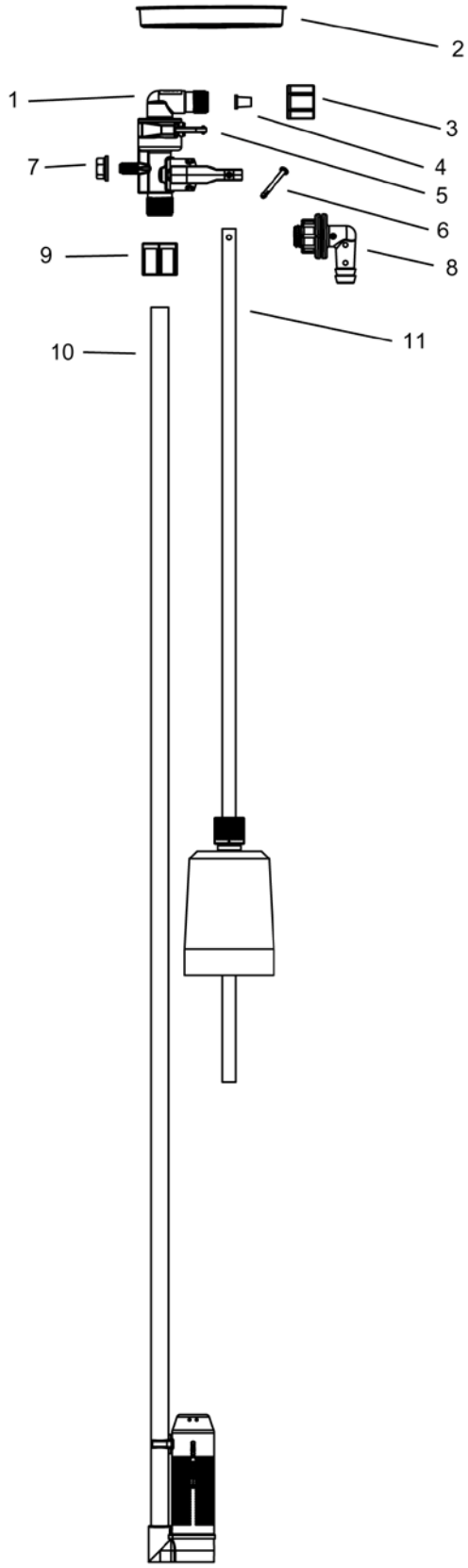
16” and 18” Brine Systems

Item No.	Part No.	Description
-	01-0187-05	Brine System, 250 lb
-	01-0187-15	Brine System, 375 lb
1	01-0187-09	Replacement Tank, 250 lb
	01-0187-16	Replacement Tank, 375 lb
2	01-0187-04	Cover, 250 lb
	01-0187-17	Cover, 375 lb
3	01-0187-07	Salt Plate, 250 lb
	01-0187-13	Salt Plate, 375 lb
4	01-0187-07	Brine Chamber, 250 lb & 375 lb
5	01-0187-06	Brine Valve



Brine Valve

Item No.	Part No.	Description
-	01018706	Brine Valve
1	01018710	BLFC Elbow - 0.45 gpm
	01018711	BLFC Elbow - 0.8 gpm
2	P1020194	Brine Well Cap - 24 Pack
3	P1020196	3/8” Compression Nut - 24 Pack
4	P1018871	3/8” Insert - 25 Pack
5	P1012091	Retaining Clip - 24 Pack
6	P1020192	Pin - 24 Pack
7	P1020193	5/16” Nut - 24 Pack
8	P1020190	Overflow Fitting w/ Nut - 24 Pack
9	P1020195	3/8” Nut - 24 Pack
10	P1020198	Air check Assembly - 24 Pack
11	P1020197	Float - 24 Pack



11” Brine System

Item No.	Part No.	Description
-	01-0187-70	Brine System, 156 lb
1	01-0187-69	Replacement Tank, 156 lb
2	01-0189-10	Cover, 156 lb
3	01-0187-64	Salt Plate, 156 lb
4	01-0187-68	Brine Chamber, 156 lb
5	01-0187-06	Brine Valve